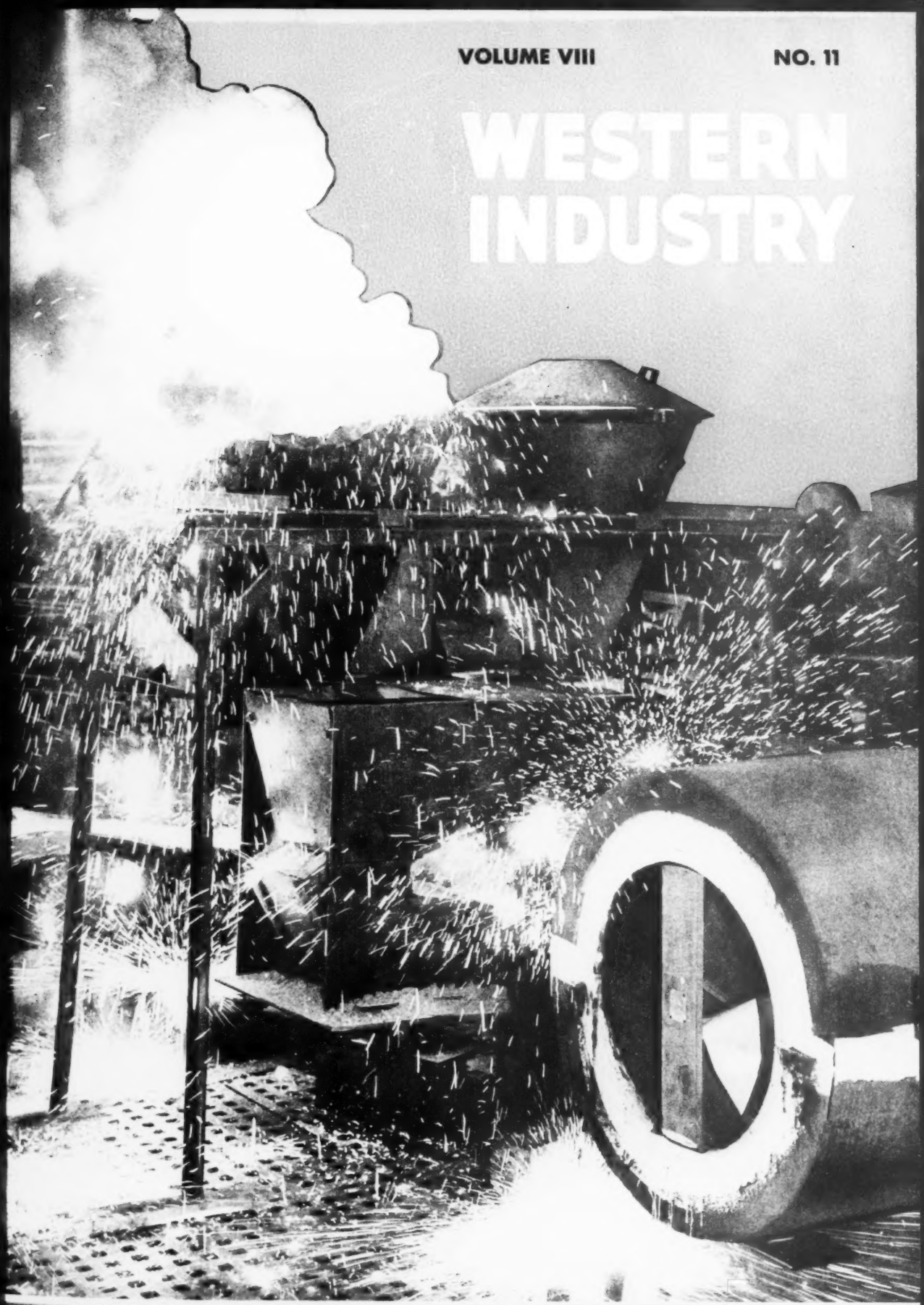
VOLUME VIII NO. 11

WESTERN INDUSTRY



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EDITORIAL COMMENT

(Communications on any subject of interest to our readers are welcomed. If author wishes, his name will not be used. Unsigned contributions will be disregarded.)

Protecting the West's Future

FOR its foresight in beginning an early attack on the problem of what will become of the big war plants built in the West with government money, the western regional conference of the National Council of State Governments is to be specially commended. While the Council is committed to the principle of free enterprise, and looks to private business as the primary source of industrial energy, nevertheless it very properly does not wish to have these big plants turned over to some corporation at a bargain price, only to have them shut down and perhaps dismantled, merely because the newcomers consider it advisable to concentrate their manufacturing operations east of the Rockies.

Therefore this conference, which at present seems to be the nearest approach to a "Western bloc," is asking the federal government to define its post-war policy regarding these plants, and urging not only that they be turned over to private industry for operation, but also that a guarantee be given that they will continue in operation.

As the federal government has invested more than four billion dollars in facilities in the eleven Western states in the war period, the fate of these big war plants is of tremendous importance to the future of industry in the West. In the long run they will have to stand on their own feet against competition, but they should not be chloroformed like surplus kittens as soon as the war is over simply because some eastern-minded board of directors thinks they are too expensive to operate. In the first place, these directors may not be infallible, and in the second place the industrial development of the West is a matter of public interest. Consequently, having the government retain control of these properties during the transition period from war to peace may be more desirable than putting them on the auction block.

Obviously Jesse Jones isn't going to come out immediately and commit the government on its post-war plans for these facilities. But it is high time to start in putting pressure on the government so that the men in command at Washington will fully realize how important a matter to the West this is and give a commitment at an early date. Otherwise we may find that without our knowledge deals have been cooked up which it will be too late to change.

Recognize Need Of Unity

Two Western governors have commented favorably on the October editorial urging unity among Western states.

Says Governor E. P. Carville of Nevada: "I read with interest the article contained in the October issue of *Western Industry*. I have always contended that the Western governors should work together for the good of the nation and their states and I am convinced more than ever that this should be done at this time. Uniformity of purpose is essential to accomplish anything worth while for the Western States."

Governor Sam C. Ford of Montana writes: "I am in accord with the ideas expressed in the editorial, encouraging unity among the Western States in regard to our immediate and post-war problems, and wish to thank you for your courtesy in sending it to me."

WESTERN INDUSTRY

News, Methods, Solutions to Problems of the Principal Manufacturing and Processing Industries of the West

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OUR COVER PICTURE

• Thermit welding the stern frame for a T-2 tanker at Marin Shipbuilding Corp., Sausalito, California. When complete, the frame weighs 23 tons and becomes part of a 60-ton prefabricated stern section. The thermit system is used to generate the heat, approximately 4,000 degrees F., necessary to weld large sections of steel. The Pacific Coast is now the principal construction area for tank ships used to carry oil to our armed forces all over the globe.

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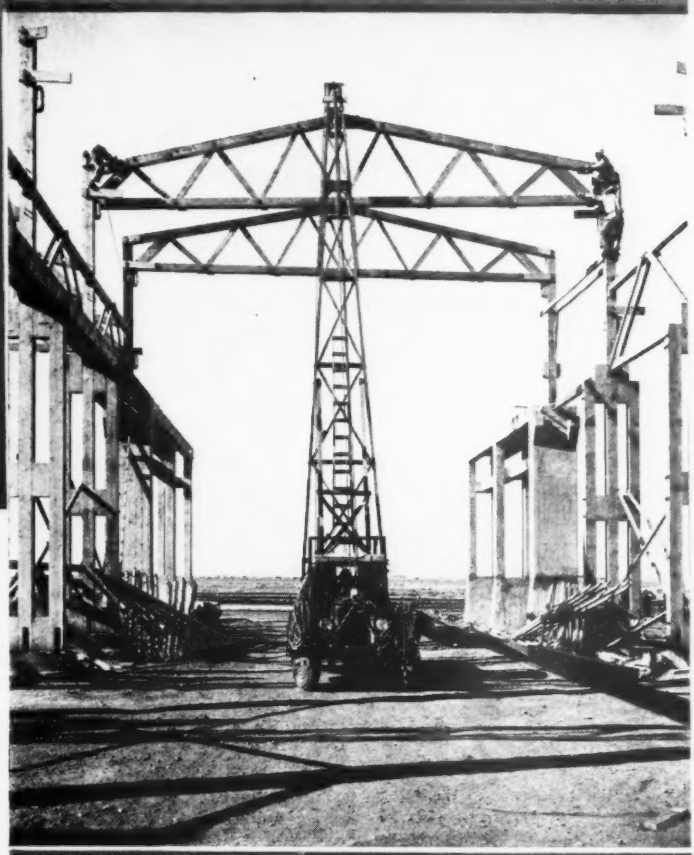

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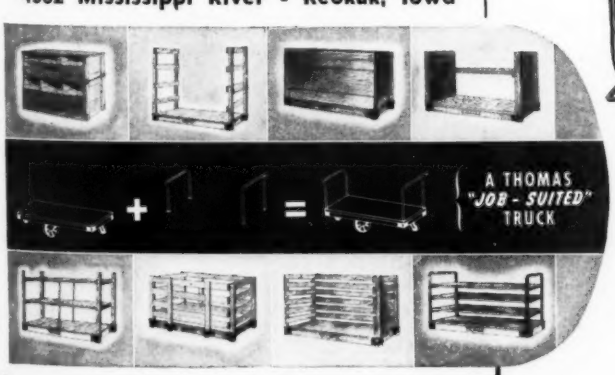

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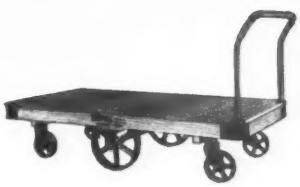

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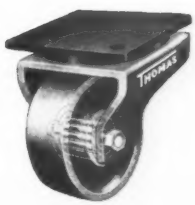

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Thanks To America's Factories

When certain pirates started picking off what they wanted in China, Africa, Europe and the Pacific—before coming at *us*—they figured that the U.S.A. couldn't do much about it. We didn't have enough ships to handle even 30% of our *peacetime* ocean traffic! How could *we* interfere!

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You Have Helped Us Do Our Part

We thank you, loyal customer, for conserving Wickwire Rope so that more can go to the Liberty Ships. But when you *need* new wire rope to maintain war production, tough, long-lived Wickwire Rope will always be available on priority, to the best of our ability.

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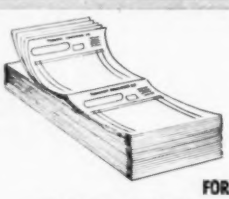

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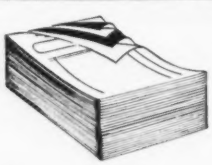

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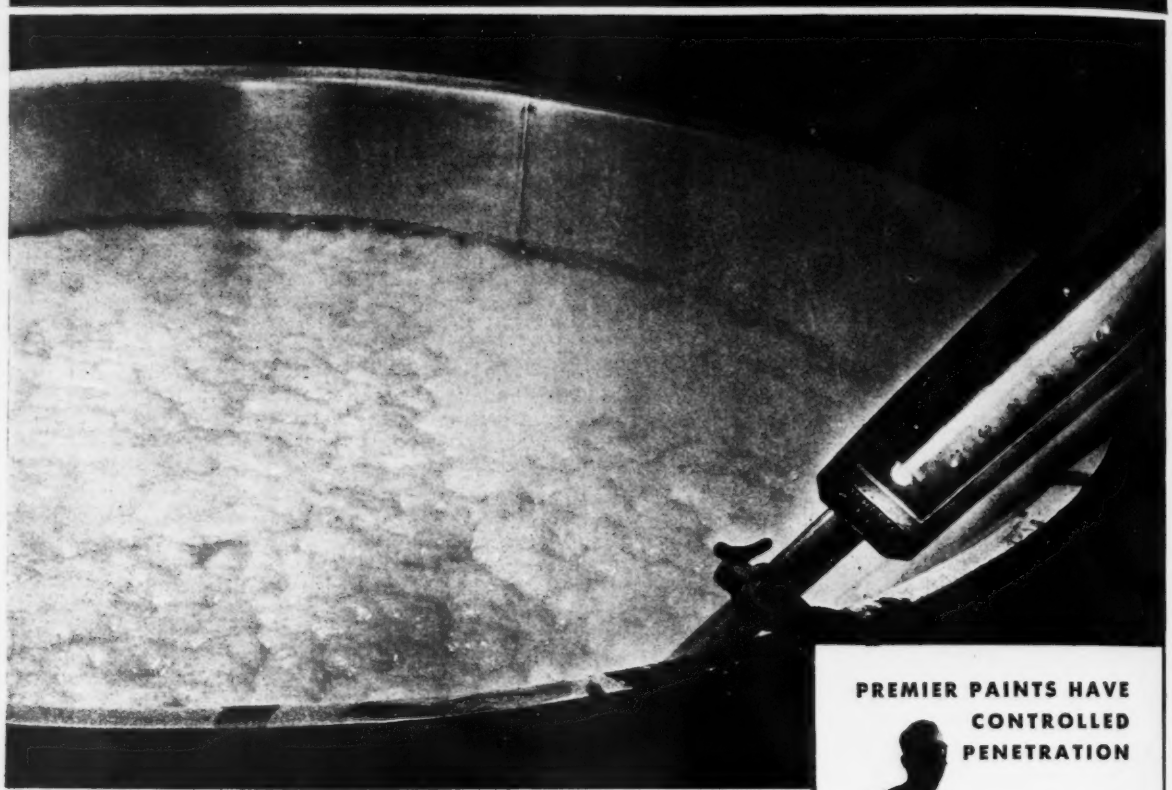

Making paint is a lot like baking a cake. First you get a recipe; second, the ingredients used will determine the quality; lastly, they must be put together properly, to obtain the desired results.

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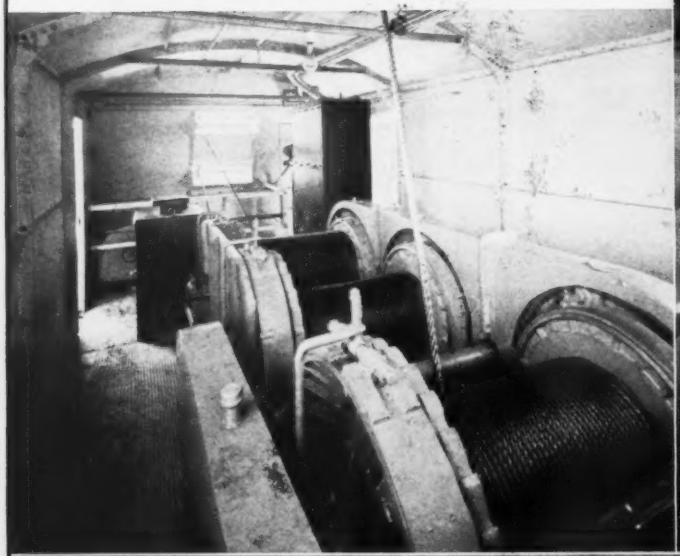

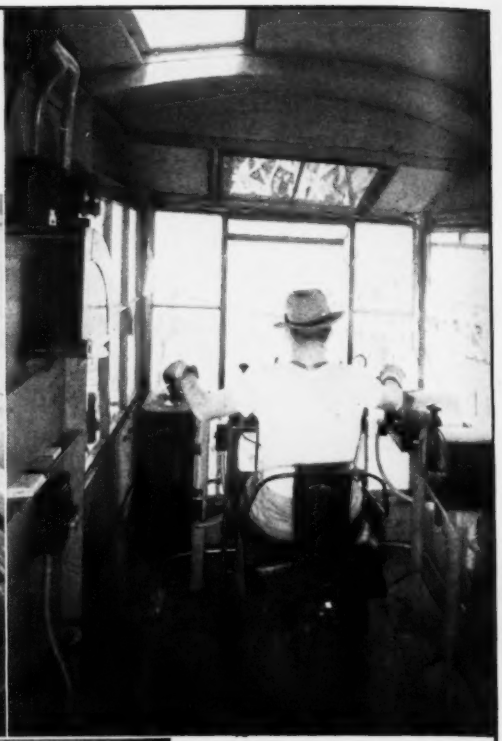

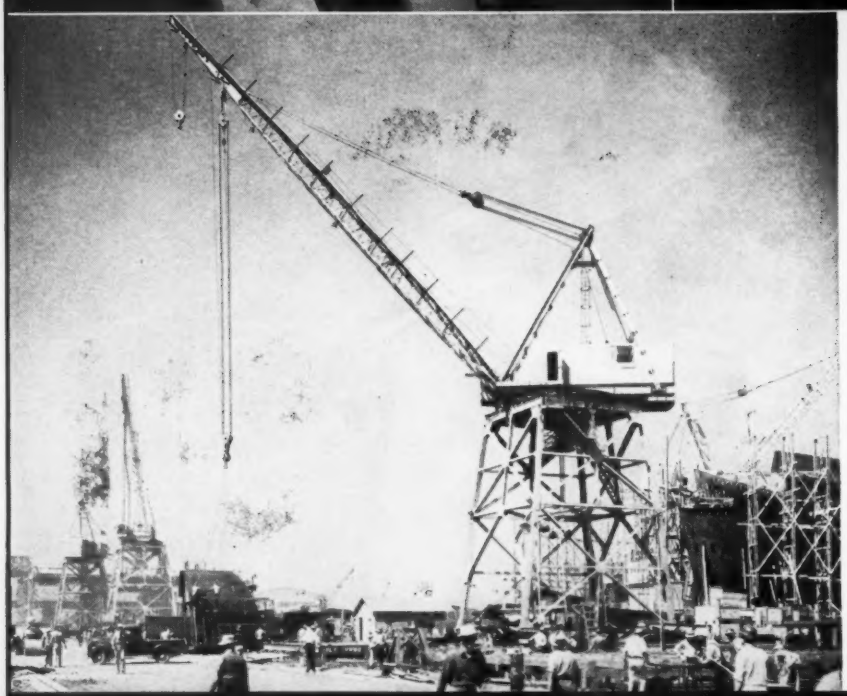

Colby Cranes are famous for their clean-cut construction and operating efficiency.

TOP RIGHT: *Interior view of machinery cab, showing topping hoist (foreground) then whip line and main load hoists. Silent chain drive (in housing at left) operates each hoist separately by air-friction band type clutch.*

ABOVE *Operator at controls. Note quadrant at left which registers radius of boom and lifting capacity at all positions.*

LEFT: *One of hundreds of Colbys now operating night and day, from coast to coast, in America's leading shipyards.*

★ ★ ★

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HOW GOODALL PRODUCTS SERVE THE INDUSTRIAL WEST . . . THE CONSTRUCTION INDUSTRY

Santa Fe Dam . . .

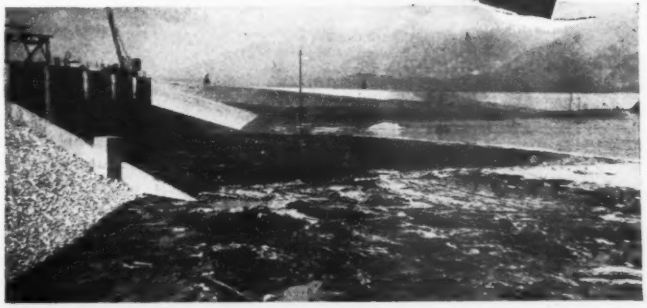
GOODALL Hose, Boots and Clothing Used on this $11,000,000 Project!

THE CONSTRUCTION industry is another of the many western industries served by GOODALL rubber products. Contractors on outstanding western jobs — like the $11,000,000 Santa Fe Dam—continue to prefer GOODALL. Smart contractors everywhere know that GOODALL rubber products—hose, boots, clothing, belting and gaskets—do the job speedier, cheaper and safer.

There is a specific GOODALL "Standard of Quality" product to solve every industrial problem. Four district offices in the West, with personnel trained in synthetic and natural rubber are at your service. A staff of technicians, with modern equipped laboratories at our mills, are available to you without cost or obligation.

Why not call on us today for a solution to your current and post-war problems?

● *(Above)* Trash gates for outlet structure of Santa Fe Dam. ● *(Right)* GOODALL air hose carries the power to pneumatic tampers. ● *(Below)* Over-all view of earth embankment and outlet structure under construction.



GOODALL RUBBER COMPANY

(CALIFORNIA)

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Mills — Trenton, N. J.

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This night scene is commonplace in any of the three General Metals plants.

Despite the demand for production, maintenance of General Metals' high quality castings and forgings remains a paramount consideration. An even more stringent system of laboratory checks and controls is in effect. In addition, new equipment such as the 12,000 pound hammer recently installed, has broadened plant facilities to a point where Western Industry is assured a dependable source for their requirements.

Three great General Metals plants are strategically located in Oakland, Los Angeles and Houston. Concerns desiring *quality* castings and forgings will find our quotations well in line.

GENERAL METALS CORPORATION
Oakland · Houston · Los Angeles, Cal.

GENERAL METALS ***Castings and Forgings***

Spotlight on the NEWS

WESTERN INDUSTRY
FOR NOVEMBER, 1943

VOLUME VIII NUMBER 11

Puget Sound Area Future

An increase in population of 1,000,000 in the Puget Sound area in the next 35 years, due to industrial expansion, is predicted by a post-war committee set up by Mayor Harry Cain and headed by Dr. Paul Fossum of the College of Puget Sound.

Seattle will be the central city, according to the committee, expanding from its present estimated population of 452,639 to more than 1,000,000. Second city will be Tacoma, which is expected to grow from the present estimated 156,000 to more than 375,000.

Immediately after the war the Puget Sound area will lose from 15 to 25 per cent of the population that came there as a result of the war industries. But during the 1950's the area is expected to experience a boom and consequent population growth that will reach about 2,179,000 in 1980.

By 1980 the committee believes Aberdeen and Hoquiam will have a combined population of 71,553 (the 1940 count indicated 29,681); Everett, 72,898 (30,224 in 1940); Bellingham, 70,586 (29,314 in 1940); and Olympia, 31,885 (13,254 in 1940).

12,000 Rubber Workers

A post-war synthetic rubber and tire industry employing at least 12,000 workers is foreseen by major tire companies in their future plans for the Los Angeles area. Scheduled to reach wartime capacity production by the first of next year, this industry does not expect much transitional lag in peacetime conversion because of the large potential civilian demand.

Herbert E. Smith, president of the U. S. Rubber Co., said while visiting his company's developments in Los Angeles that "synthetic rubber is here to stay and it is a welcome advent into the industry."

He predicted a bright future for the synthetic plants in Southern California, and foresees great possibilities in Oriental markets after the war. "U. S. Rubber Co. plans to gear activity in Los Angeles to keep pace. We have in mind a post-war period of extreme importance and Los Angeles harbor should become the center of a large export trade," he said.

Mr. Smith said self-sealing or bullet-sealing qualities now being used in airplane gasoline tanks will make the tires blow-out proof from the standpoint of an accident hazard.

Industrial Payroll Climbs

Decided gains in Washington's 1943 industrial payroll, calculated on increases of the first five months are estimated by Robert Harlin, director of the Department of Labor and Industries.

He estimated the year's industrial payroll as $1,013,112,000, as compared with $815,109,000 in 1942 and but $475,291,000 in 1941. Total work hours if the remainder of the year bears out the increases of the first five months will be 886,892,000 as compared with 776,000,000 and 561,751,000 in 1942 and 1941.

Estimated payrolls for the year in Washington's six top industrial fields are: General construction, $425,580,000; building construction, $85,440,000; lumbering, $87,600,000; machine shops and metal trades, $54,960,000; plane manufacture, $89,280,000; shipbuilding, $293,040,000.

$40,000,000 For Gasoline

Union Oil Company has nearly completed a 100-octane refinery at Los Angeles Harbor, where new methods make it possible to get twice as much gasoline yield for each barrel of crude oil processed, in other words, from 22 per cent recovery to 44 per cent. They are getting aviation gasoline from residuals formerly used only for fuel oil. This is a $40,000,000 project.

Will Decentralize Steel

Construction of the $190,000,000 Geneva Works steel mill in Utah was in compliance with a national policy of decentralizing the steel industry and establishing huge mills in the West on a permanent basis, according to Jesse Jones, chairman of the Reconstruction Finance Corporation and Secretary of Commerce.

This plant and the Kaiser steel mill in Southern California will make the West Coast industries no longer dependent on steel mills of the East, he told the small business committee of the House.

"The government will be able to transfer both these steel mills to private industry after the war," the secretary predicted. "When we made that $190,000,000 investment in Utah, we had in mind the establishment of a permanent and nearby source of steel for west coast industries. The government had clearly in mind the desirability of decentralizing the steel industry."

More Denver Marine Jobs

After building sections of destroyer escort vessels as their first experience in shipbuilding 1300 miles from the ocean, the nine Denver contractors who had been engaged in that project, plus two more, are constructing 10 amphibious landing craft at a cost of $150,000 each. Expert shipbuilding men were brought from the Mare Island Navy Yard in California to train the Denver workmen, and Commander W. E. Howard from Mare Island is quoted as saying that shipbuilding in inland Denver is no longer an experiment. The craft are shipped to the West Coast for assembly.

Colorado industry is looking forward in its postwar plans to considerable development resulting from the reclamation of gasoline from oil shale deposits. Oscar L. Chapman, assistant secretary of the interior, on a recent visit to Denver, said he was confident Congress would pass Senator O'Mahoney's bill providing for this.

No "SHADOWTAGE" here

"Shadowtage" means sabotage due to shadows on the working plane — especially when they blur delicate machining operations held to tolerances of 1/10,000th of an inch.

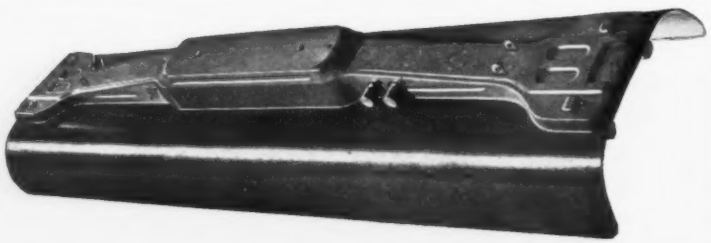
The best-known answer to "shadowtage" is the scientific installation of shadowless and glare-free fluorescent lighting.

It is our job to supply the fluorescent and incandescent lighting equipment that is helping to speed war production all over the country.

Aggressive and independent Sylvania research developed and introduced the first successful fluorescent installation — forerunner of war plant fluorescent by the thousands of miles of lamps today.

And now — years ahead of time — Sylvania is producing the fluorescent fixture of the future. A revelation in simplicity and adaptability, *one* standard fixture meets any industrial lighting requirement. Similar developments may bring economical fluorescent lighting into American homes after the war.

For industrial fluorescent lighting equipment, designed to work together, specify Sylvania Fluorescent Lamps, Fixtures and Accessories for replacements and authorized new installations.



THE FIXTURE OF THE FUTURE. This new fixture, which can challenge comparison with any other in the fluorescent field, is much more than a design to save critical war materials. Its non-metallic reflector has an efficiency of 86 per cent — actually more than that of enameled metal. The streamlined top housing, constructed like a cantilever bridge, encloses the ballast—protects it from dust—provides cooler performance.

SYLVANIA

ELECTRIC PRODUCTS INC.

Formerly Hygrade Sylvania Corporation

Incandescent Lamps, Fluorescent Lamps, Fixtures and Accessories, Radio Tubes, Cathode Ray Tubes, Other Electronic Devices

MANPOWER'S OUTPUT MUST MATCH BATTLE'S WASTAGE

Incredible Rate Of Destruction Proves Need For The Drastic Steps Already Taken in West Coast Program To Conserve Our Labor Supply

SINCE manpower's job in the war effort is to produce the materiel which our armed forces employ to achieve victory, manpower has a logical query today. It is this: "How badly do you armed forces need all these ships, planes, tanks, bombs and shells? How fast do you use them up? Just how long and how hard do we have to work to keep you supplied?"

Consequently, if everyone concerned in the West Coast Manpower Program which the government is now endeavoring to put into operation could consider it in the light of its urgency, no doubt the details of the program would be worked out more intelligently and applied more conscientiously. Vigorous steps already have been taken, but there would be more cooperation all along the line if the whole picture could be seen.

If we could tell just how much production effort it will cost us to capture Rome, to cross the Alps and the English Channel, to march into Germany, to retake the Philippines, to seize Tokio, it would be simple to know just where we stood.

Unfortunately, the enemy also would very much like to know how much we figure these campaigns will mean in dollars, volume of output and manhours, and make his plans accordingly, so the whole picture cannot be revealed. But enough comparisons are available from public statements by our military authorities to enable us to get some highly significant glimpses. How much we take these glimpses to heart depends on the conscience of the individual.

First of all, how much do we produce in the eleven Western states? The only available figures are the average volume of war supply contracts awarded, which have been furnished *Western Industry* by the statisics division of WPB.

Although these figures may not correspond even approximately with the volume of production during the relatively short period covered, and although they exclude awards of less than $50,000 and awards for foodstuffs, nevertheless they constitute a yardstick that it will hurt no one to apply. Here they are, in dollar value of monthly average volume:

Product—	June-August, 1943	March-August, 1943
Total	$907,965,000	$696,442,000
Aircraft	577,621,000	389,612,000
Ships	188,430,000	189,661,000
Other	141,914,000	117,169,000

Taking the monthly June-August average as our yardstick, assuming that this period more nearly represents the present

PRODUCTION URGENCY COMMITTEE, NORTHERN CALIFORNIA: One of many sessions to determine whose needs are most critical. Clockwise, from left front around the table: N. S. Laidlaw, ODT; Major E. M. Durst, Aircraft Resources Central Office; Geo. Hillenbrand, WSA alternate; R. W. Owens, Maritime Commission; Lee R. Smith, (vice-chairman), Production Service Division, WPB; Murray Brookman, (chairman) Deputy Regional Director, WPB; Major Walter L. Burroughs, Ordnance Dept., alternate for Col. Dean Witter; Capt. F. G. Crisp, USN, Mare Island Navy Yard; L. E. Fleming, PAW; Richard Elkus, SWPC alternate for Roland Tognazzini; James Blaisdell, Area Director, WMC (also chairman WMC Labor Priorities Committee); W. R. Ralston, WFA alternate. Against the wall from left: Capt. G. H. Laird, USN alternate; Capt. A. B. Court, USN, Inspector of Naval Materials; George Prussing, (visitor) PAW, Los Angeles; Geo. Wilson (visitor) PAW, Washington, D.C.; R. M. Dorton, Committee on Congested Production Areas.

peak of production than the March-August average, let us see how far it goes. Following are a few examples (even if our arithmetic should be found wrong it would not change the facts materially):

■ Our initial landing on Sicily — just the beach head operation, not the land and sea action required to conquer the whole island, took one year's output of Liberty ships from the West Coast.

Here is how *Western Industry* figures it: Official statements from Washington give the number of ships required for the landing at 3,000. Estimating that about 1,200 of these were Liberty ships, at a cost of $1,780,000 each, this would mean $2,336,000,000. As the monthly average contract awarding of ships is $188,430,000, a year's output would be $2,261,000,000. Of course, these ships (or very few of them, at least) were not lost and are being constantly used in other operations. Nevertheless, it took a year's work to get ready for this one job.

■ One week's war effort for the entire West was required to produce (in equivalent output) the guns, tanks and vehicles alone required for the landing on Sicily.

Published figures on the requirements, with the estimated cost, are as follows:

1,800 guns @ $30,000 each	$54,000,000
600 tanks @ $47,000 (figuring $55,000 for medium tanks, $32,000 for light, used in ratio of 2 to 1)	28,400,000
14,000 vehicles averaging $10,000 each (just a jeep costs $1,100, so the figure is conservative)	140,000,000
Total	$222,400,000
Total above multiplied by 4 to get a month's output	$889,600,000
For comparison, the West's monthly output	907,965,000

■ Five hundred bombers needed for one big raid would take about one-third of our monthly Western output of planes.

500 bombers @ $400,000 each totals	$200,000,000
Monthly average output of aircraft	577,000,000

■ Ten ordinary divisions may use up in one day's firing of ammunition the equivalent of the production of one 8-hour shift for the entire war effort of the West:

One division may use 540 tons (an armored division 600 tons) @ $1 per lb., or $1,080,000. Ten divisions would use	$10,800,000
One day's output ($907,965,000 divided by 30) equals $30,265,833, divided again by 3 to get one 8-hr. shift	$10,132,916

■ To keep 12,000 men overseas in the Pacific supplied requires almost one-half of the West's monthly output of ships. To get them there in the first place takes 10 to 15 times that much.

Each man requires 1.2 short tons a month (some army men figure this at 2 tons), so 12,000 would require 144,000 tons. To get 100,000 long tons to Australia each month takes 44 ships costing $78,320,000 (@ $1,780,000 each for Liberty ships). Our monthly Western output of ships is $188,430,000—half of that is $94,170,000. The difference between long tons and short tons probably would equalize the difference between that and $78,320,000.

■ The West's monthly war output will put 9,070 men overseas. One year's output would put 108,840 men overseas.

It takes 15 tons average to initially supply each man overseas ready for combat. In terms of automobiles (@ 3,000 lbs. each, costing 33c a lb.) that would mean 10 automobiles @ $990 each or $9,900. Dividing the West's monthly total output of $907,965,000 gives 9,070 men. One year's output would be 108,840 men.

There are plenty more figures of interest. To get 100,000 long tons from San Francisco to Australia each month takes 44 ships, 3,200 men and 165,000 barrels of fuel. To support a force of 500,000 men, port facilities for 68 Liberty ships are needed monthly, which is equal to 750,000 ship tons a month.

As for the cost of naval ships, PT boats cost $400,000 each; cruisers range from $23,000,000 to $39,000,000; aircraft carrier auxiliaries $7,000,000; aircraft carriers without planes, $35,000,000 to $50,000,000 each.

"In Sicily we lost 13% of our big 155-mm howitzers," stated Col. Lee A. Denson, acting director of the requirements division of the Army Services Forces at the War Department conference of industry, labor and newspaper leaders at Washington, September 28. "In that month we lost 36 out of each 100 motor carriages for our 75-mm howitzers, 46% of our 57-mm guns were knocked out and for a certain gun mount the loss was 54%. And remember that this was only a minor campaign, lasting only 30 days, against a mixed German and Italian army, with the Italians ready to quit."

AFTER overcoming considerable "sales resistance" at the outset to the West Coast Manpower Program from management and labor on the Pacific Coast, the War Manpower Commission, through W. K. Hopkins, coast director, and Leo. R. Werts, deputy executive director from Washington, D.C., have gotten the wheels turning with considerable success so far. By establishing "ceilings" above which no labor may be hired by individual plants, they have begun to make deep cuts in the labor requirements in each area.

The success of Mr. Hopkins, Mr. Werts and their staffs is due in large measure to the fact that the program is not something new, suddenly devised at Washington, but the crystallization of study, observation and experience that have been going on for a long time. Consequently WMC was able to move ahead on it with a minimum of lost motion.

Through the cooperation of Selective Service, draft deferments also have been granted for plants where the labor situation was most critical.

The next step is controlled referrals, just going into effect, by which all employment through the U. S. Employment Service and the unions is directed into channels specified by WMC.

Investigation of labor utilization, to determine what plants are making the best use of their labor force, has been under way for some weeks in a few establishments, with more coming in. Labor utilization will be one of the chief factors in setting labor priorities.

Meanwhile community recruiting campaigns are going on in the various areas, even to the point of house-to-house solicitations in some instances.

Perhaps the most outstanding development in the application of labor ceilings is in the Portland district, where the area Manpower Priorities Committee set ceilings at the July 1 employment level for all employers except three high priority firms. As a result, clearance orders for approximately 56,000 workers on file at the U. S. Employment Service were immediately canceled.

Firms placed on the priority list for additional manpower were the following: Aircraft carrier production by the Kaiser Vancouver yard permitting out-of-area recruitment for 10,000 workers; Gunderson Brothers, permitting employment of 206 workers from local sources; Willamette Iron and Steel Corporation, permitting employment of 1,500 workers from local sources.

In the Seattle area, Boeing Aircraft's desperate manpower situation seems to be now well on the way to solution, with more applications for employment coming than can be immediately handled. The figures for September, in comparison with net decreases in employment in almost every preceding month, were as follows:

Employment September 1		*Accessions*	*Separations*	*Net Gain*
Main Plant	28,786	3,167	1,556	1,611
Renton	5,039	849	354	495

Between September 20 and October 5, the U. S. Employment Service referred 1,099 applicants to Boeing, of which 563 were reported as verified placement. Boeing also was able to be more strict in its qualification requirements because of the larger supply of labor available. In addition to the local placements, Boeing hired 1,090 workers through the inter-regional clearance system of the U.S.E.S.

Boeing's priority over the ship repair yards and the reduced ceilings assigned to the ship construction yards were specifically endorsed by the Chief of the Navy

(Continued on Page 24)

BATTLE'S TOLL TOLERATES NO LET-UP!

1,000 men's output for 12 months disappears when 60 bombers are lost in one raid . . .
That was the man-hour cost we paid for our success in destroying Germany's ball and roller bearing factories at Schweinenfurt, estimating from aircraft industry production statistics.

"Ten fighters failed to return"—110 men must work for a year to replace those P-38's . . .
Even though production time on aircraft has been reduced remarkably since 1940—it took 232 employees a year to turn out one P-38 then, but only 11 for the same job now—time still is a precious commodity, and must be put to the wisest use.

One torpedo sinks a Liberty ship; it took 37 men a week just to assemble its engine . . .
One of the top records in Liberty engine assembly is 1800 man-hours, but it takes several times as long as that to cast and machine the cylinder block and all the gears, shafts and valves.

U-boats get one of our C-4 transports; 25,000 shipyard people must toil another month . . .
All that labor includes only the assembly operations in the shipyard, exclusive of manufacturing the propulsion machinery, the deck and side plates, etc. Plenty more hours not counted in.

2,000 men and women take 30 days to build just one Liberty ship—if she hits a mine—???
How many man-hours in all it would be if we could produce figures showing how much equipment and supplies are stowed into the hold of each vessel, and how long it took to make them!

If a tanker goes down, the efforts of 833 workers for a year are lost right there . . .
More than half of all the tanker construction in the country has been allotted to the Pacific Coast. These boats are what get the gasoline over there for the flyers, for the tanks, for the bulldozers and the tractors that prepare the landing fields.

MANPOWER *(Cont'd from Page 22)*

Bureau of Ships in a public statement in which he agreed that the ship construction yards were overmanned.

Priorities established for the Washington area were as follows:

a. Boeing Aircraft Co. (ceiling 38,000—employment October 1 about 31,000)
b. Puget Sound Navy Yard (ceiling 36,000—employment October 1 about 28,000)
c. Ship repair
   1) Todd Dry Docks (ceiling 4,500)
   2) Lake Union (ceiling 1,065)
d. Temporary priority to meet urgent demands of Griffin Wheel Co., railroad wheel manufacturer

Ten categories of employment ceilings established by the committee have been accepted by the state WMC director, Al Hardy. Of these, the most significant are:

a. In the Puget Sound area the ceiling for each shipbuilding establishment not specified is 90 per cent of the employment on August 31, 1943.
b. For most types of employment throughout the state, ceilings were established at August 31 employment levels. This was done by blanket action with the provision the changes may be made by specific petition to the state director.
c. All nondeferrable activities were placed in Class III without designated ceilings.
d. For other categories, such as railroads, lumber and logging, and agriculture, it was provided that ceilings shall be set in accordance with labor needs to meet production requirements as determined.

Recruitment for the Puget Sound Navy Yard has resulted in clearance orders being authorized into eight regions for 2,600 workers and to Region XII for 1,200 more. No special recruitment is going on for the other yards, most of whom are considered overmanned.

Selective Service headquarters instructed its local boards to postpone induction of aircraft workers in California and Washington. As a result, approximately 2,800 workers scheduled for induction continued in employment in California aircraft plants, and in Washington approximately 1,350 inductions of aircraft workers were postponed. Local Selective Service Boards have been instructed to gear their withdrawal schedules to the employment ceilings recommended by the Area Manpower Priorities Committee. Employers in essential activities have been advised to submit revised replacement schedules.

Ceilings have been established in the Los Angeles area for 87 aircraft production plants, 12 high octane gas production plants, one shipbuilding plant. As a result of priorities and ceilings set by the Manpower Priorities Committee, a total of 2,543 referrals have been made to aircraft assembly plants and 1,002 to subcontractors, and 139 referrals to high octane gas construction plants, exclusive of union referrals.

A picture of some of the various phases of the manpower situation is given in the following WMC statistical studies, prepared by Dr. Louis Bloch, in charge of that work for the Pacific Coast:

LABOR DEMAND

Anticipated increases in the major industries in Region XII from July, 1943, to January, 1944, by industries:

Industries	*July Employment*	*Anticipated increase in January, 1944*
Shipbuilding	603,598	122,872
Aircraft	429,627	54,974

EMPLOYMENT FIGURES

Employment in California, Oregon and Washington in specified industries for July, 1943, and anticipated increases or decreases in employment for November, 1943, and January, 1944.

Industries	*July '43 Perc. of distrib.*	*Nov. '43 Perc. of distrib.*	*Jan. '43 Perc. of distrib.*
ALL INDUSTRIES	100.0	100.0	100.0
Shipbuilding	36.8	48.5	49.7
Aircraft	25.6	25.1	21.1
Transportation, communications and public utilities	7.4	1.4	1.2
Government Establishments	6.5	9.9	12.2
Lumber and timber products	5.6	3.2	4.7
Construction	3.1		
Machinery (except electrical)	2.6	2.5	2.7
Iron and steel products	2.2	2.5	2.1
Food and food products	1.4	1.3	.3
Nonferrous metals	1.4	1.9	2.0

DISTRIBUTION OF EMPLOYMENT—SIX HIGHEST INDUSTRIES

Region XII, as of July, 1943

Region XII	*Percentage distribution*
All industries, total	100.0
Shipbuilding	35.5
Aircraft	25.2
Transportation, commun., pub. util.	7.3
Government establishments	6.7
Lumber and timber products	5.5
California	
All industries, total	100.0
Aircraft	33.0
Shipbuilding	31.8
Transportation, commun., pub. util.	8.1
Government establishments	5.5
Construction	3.3
Machinery (except elect.)	3.1
Washington	
All industries, total	100.0
Shipbuilding	44.2
Government establishments	12.4
Aircraft	11.0
Lumber and timber products	10.9
Transportation, commun., pub. util.	5.6
Construction	3.4
Oregon	
All industries, total	100.0
Shipbuilding	58.1
Lumber and timber products	23.0
Transportation, commun., pub. util.	5.5
Aircraft	1.9
Paper and pulp products	1.8
Construction	1.5

GEOGRAPHICAL DISTRIBUTION OF EMPLOYMENT (July, 1943)

States	*Percentage distribution*
Total of three coast states, Arizona and Nevada	100.0
California, Oregon and Washington total	96.2
California	67.8
Oregon	9.4
Washington	19.1
Arizona and Nevada, total	3.8
Arizona	2.7
Nevada	1.0

EMPLOYMENT OF WOMEN

Industries	*July '43 employ.*	*Perc. distr.*	*Perc. of total employ.*
All industries	450,808	100.0	26.5
Aircraft	186,424	41.4	43.4
Shipbuilding	97,347	21.2	15.8
Govt. estab.	49,362	10.9	43.1
Transportation, communication, pub. util.	43,004	9.5	34.6
Machinery (not elect.)	8,287	1.8	19.3
Food, food products	7,744	1.7	32.6
Lumber and timber	7,143	1.6	7.7
Rubber (Calif.)	7,043	1.6	46.6
All others	46,444	10.3	

TURNOVER—AIRCRAFT INDUSTRY

Average monthly number of separations for May-June in Region XII, by states:

States	*Separation rates per 100 employees*
Region XII, Total	7.7
Arizona	10.3
California	7.2
Oregon	14.3
Washington	11.5

Range of turnover in aircraft establishments of comparable employment in California for May-June 1943:

Range of Employment	*Lowest Turnover*	*Highest Turnover*
100-500	1.1	58.5
500-1,000	2.6	14.7
1,000-5,000	4.7	17.6
5,000-10,000	7.5	9.0
10,000-20,000	(No firms in this bracket)	
Over 20,000	5.0	8.2

(Decrease in turnover range as establishments get larger partly due to smaller number of firms in the higher brackets)

TURNOVER—SHIPBUILDING

Average monthly number of separations for May-June in Region XII by states:

States	*Separation rates per 100 employees*
Region XII, Total	11.2
California	11.0
Oregon	14.5
Washington	9.5

Range of turnover in establishments of comparable employment in California for May-June 1943:

Range of Employment	*Lowest Turnover*	*Highest Turnover*
100-500	4.8	39.3
500-1,000	2.7	29.4
1,000-5,000	5.4	34.0
5,000-10,000	7.4	20.0
10,000-25,000	10.0	15.6
Over 25,000	4.7	12.4

TURNOVER—ALUMINUM INDUSTRY

Average monthly number of separations for May-June in Region XII by states:

States	*Separation rates per 100 employees*
Region XII, Total	15.6
Arizona	15.0
California	19.8
Oregon	16.6
Washington	10.2

The range of turnover in the 10 aluminum firms in Region XII was 4.7 per cent for the lowest to 24.7 per cent for the highest.

No doubt the tightening up will cut down greatly the turnover. Donald Douglas recently reported that the aircraft industry in southern California hired 150,000 people in the first six months of 1943, but 130,000 quit, leaving a net increase of only 20,000. Indiscriminate quitting now is stopped through controlling what jobs persons who quit may take, so they will go where they are needed.

• The industrialized West—a battery of multiple drills used in the production of Boeing Flying Fortresses.

POST-WAR— Holding the West's Gains

National Council of State Governments Wants to Smoke Out Washington For an Announcement of Policy Regarding Future of the Big War Plants

ALTHOUGH the western regional conference of the National Council of State Governments is doing a highly creditable job of correlating the post-war planning activities of the individual states so as to cushion the shock of readjustment to peace-time conditions, it is not at all satisfied that adequate overall planning can be done without knowing what is going to happen to the big war plants owned by the government.

Consequently one of the most important developments of the regional meeting held in San Francisco October 1 and 2 was a decision to smoke the federal government out and get a statement of policy as to the future of these plants. The Council is committed to the support of private enterprise as the primary agency in our economic life, and would like to see these factories fall into private hands—BUT.

The "but" is simply this: that if private enterprise gets control, and then some board of directors in New York or Pittsburgh decides to close down the western plants and transfer operations the other side of the Rockies, the props will have been pulled out from under some of our most important new Western enterprises.

Consequently, the resolutions adopted at the meeting called upon the Defense Plant Corporation and other federal agencies to formulate and declare at the earliest possible date a definite statement of policy for effecting post-war conversion to private ownership and operation, and to include adequate guarantees of the continued operation of these plants and facilities.

To keep the unemployment situation in the West under control, Professor Samuel C. May of the University of California, who was chairman of the recently-abolished California State Planning Board, proposed that the federal government should assume the responsibility for making the post-war adjustment. Since the great influx of war workers to Pacific Coast cities resulted from the federal government's action in waging war, it should not expect cities like Richmond and Vallejo or even the State of California to shoulder a burden forced upon it by a national situation, in his opinion.

Therefore Professor May suggested that the federal government should introduce new private capital to the coast states, such as the limited dividend housing corporations of New York, that paid dividends all through the last depression. He thought there was not enough private capital available to keep the war factories going on peace-time goods.

Another avenue of post-war effort recommended by Richard Graves, executive secretary of the League of California Cities, was the clearing off of the so-called "blighted areas" surrounding the downtown business districts of cities and redeveloping them through low-cost housing. He asserted that our large cities are dying at the core because of transportation difficulties.

The National Council is very much on its toes in warding off the encroachment of the federal government on regional and local enterprise, and the Conference

adopted resolutions favoring leadership through a central state organization for post-war planning and thinking which would provide current statistics of employment and otherwise assist industry and agriculture. It also urged close cooperation with the Committee for Economic Development and similar post-war committees, and favored public improvement programs to assist in the transition from war to peace.

Planning Summarized:
State of Washington . . .

By P. HETHERTON
Executive Officer, Washington State Planning Council

EXCLUDING military establishments and all civil employees paid by federal cheque, total manhours in 86 hazardous industries have grown from 379,926,777 for the full year of 1936, to 440,387,078 for the first 6 months of 1943; and total wages paid from $241,960,112 to $516,482,710 for the same periods. For the first 6 months of 1943 employment in shipbuilding, excluding Puget Sound Navy Yard, represents 24.1 per cent of total manhours, and 28.4 per cent of total wages.

The corresponding figures for airplane manufacture are 8.8 per cent and 8.7 per cent. (Notice the lower pay in airplane manufacture as compared to shipbuilding.)

SHIPBUILDING*
(Note: Does not include Puget Sound Navy Yard)

	Year	Manhours	Wages
	1936	1,120,009	$ 944,110
	1940	3,479,717	3,561,663
	1942	121,754,323	161,597,645
Jan.-June	1943	106,149,220	146,822,514
	AIRPLANE MANUFACTURING		
	1936	2,672,822	$ 1,864,231
	1940	13,725,166	11,118,110
	1942	71,898,587	74,997,957
Jan.-June	1943	38,662,830	44,699,452
	STATE TOTAL		
	86 Hazardous Industries		
	1936	379,926,777	$241,960,112
	1940	458,512,732	345,887,756
	1942	776,362,062	815,086,668
Jan.-June	1943	440,387,078	516,482,710

PER CENT OF STATE TOTAL

	Manhours	Wages
Shipbuilding, first 6 months of 1943	24.1%	28.4%
Airplane manufacturing, 1st 6 months	8.8%	8.7%

*Data from State Dept. of Labor and Industries.

In other words, two industries which provided but 1 per cent of employment and 1.2 per cent of wages in 1936 and are likely to slack off following victory now provide 32.9 per cent of the total manhours and 37.1 per cent of the total wages in our basic industries.

Electrical consumption has grown from 2½ billion kilowatt hours in 1940 to 8 billion in 1942, and of this 8 billion, the electro industries consume about 4 billion. But these industries, principally four pig aluminum plants, one pig magnesium plant, and one aluminum sheet rolling mill account for about 1 per cent of the total manhours and about .9 per cent of total wages. From nothing in 1939 these six light metal plants for the first 6 months of 1943 accounted for 4,880,000 manhours and $5,276,000 in wages. Yet with this minor utilization of our labor force we are producing one-third of the nation's pig aluminum.

However, while the payrolls of these light metal plants are relatively small, their importance to the state's postwar economy is very great, because they will be suppliers of raw materials for fabricating industries which will be extensive employers. They have already been of distinct advantage to the state by effecting the installation of generators and the building of a high tension grid system far beyond our earlier expectations. These cannot be taken from the state. The low-cost firm power, $17.50 per KW year, will continue to attract the electro industries.

With very few exceptions all parts of the state have experienced an increase in population; 110 towns grew from 941,601 in 1940 to 1,209,390 in September 1943—an increase of 267,789. The population of the state is variously estimated at about 2,004,716, compared to the 1940 Census figure of 1,736,191.

The State of Washington has the following programs for aid to business:

1) It provides leadership through the State Planning Council to postwar thinking and planning;
2) Through the State Planning Council a state-wide committee has been appointed to centralize and coordinate all efforts.
3) Under it, committees of 15 for post victory employment are being created in all principal cities;
4) The number of jobs in private and public enterprise is being determined;
5) Confidence in our own abilities to meet and solve postwar problems is being established;
6) Public improvement programs in keeping with our own ability to finance exclusive of federal assistance for buildings, roads, bridges, and conservation of natural resources are being developed and with the long view of establishing this procedure as part of regular budgets;
7) Cumulative reserve funds for cities are being created;
8) County and city planning encouraged to assist elected officials in regulating the use of lands;
9) General legislation and taxation policies are being studied in order that a favorable climate may be continued for business;
10) Through research small business and the industries of the state are being assisted and the problems of small business investigated.

At the state level, Governor Langlie already has a program of public improvements; buildings for the university, the colleges, other institutions, highways and bridges, experiment stations, etc., amounting to over $76,168,480.00. All of this is within the state's capacity to finance without the help of the Federal government.

California Public Works

By C. H. PURCELL
California Director of Public Works

THE State of California's program starts with an estimated $43,750,000 earmarked for a "Post-War Employment Reserve." The legislature also has approved a $30,000,000 bond issue, subject to a bond election, for purchase of farms and homes for returning veterans and appropriated $450,000 for education and other assistance to veterans of World War II.

The Department of Public Works received $12,000,000 for purchase of highway rights of way and preparations of plans and specifications for an estimated $70,000,000 post-war state highway construction program. The sum of $1,500,000 was also appropriated to aid counties in preparing plans for an estimated $20,000,000 county highway program, and $1,250,000 was appropriated from the Post-War Employment Reserve for plans, specifications and preliminary work for a post-war problem of state institution buildings.

If private building revives immediately under the influence of pent-up demands for consumers' goods, homes, alterations and improvements to factories, stores and office buildings postponed during the war, public works programs should then be properly geared to the building boom so as not to overburden the construction industry which has been greatly shrunken during the war.

On the other hand, if builders are hesitant and private construction is slow in getting under way, then well-planned programs of public works will be doubly needed. Public projects cannot, however, be expected suddenly to provide jobs for all displaced war workers and service men immediately, because before the war construction only employed about 6 per cent to 7 per cent of California's gainful workers.

Compensation As a Cushion

By SILAS GAISER
Administrator, Oregon Unemployment Compensation Commission

THE unemployment compensation program will play a very important part during the first post-war years in alleviating the shock of unemployment which will undoubtedly result in converting from a war-time to a peace-time economy, and I have made some very rough estimates of the amount of unemployment compensation that will be paid out on the Pacific Coast during the first year following the war.

Wages of persons covered by the unemployment compensation laws of California, Oregon and Washington will have increased from something over 2½ billion dollars in 1939 to nearly 8¾ billion dollars in 1944.

The extent to which unemployment compensation will be able to cushion postwar unemployment is determined by the amount of benefits that will be paid during the first year or two following the war. Roughly there should be about 830 million dollars available for benefit payment purposes in the three states here on the West Coast. But each of the state's laws provides for limitations on the payment of benefits—California will pay a maximum of $468 to a claimant in any one year and Oregon and Washington will pay a maximum of $240.

Assuming that the other two states on the coast will pay out benefits during the first postwar year in the same proportion as we have estimated for Oregon, I would say that probably about 400 million dollars will be put into circulation here on the coast during the first year following the war by the unemployment compensation program.

That sum is a far cry from the four billion or so dollars by which payrolls will shrink. But it should be a big boost to the individual worker left without work at least temporarily, and should be an important stabilizing influence on purchasing power.

We estimate that nearly 190,000 claimants will file for benefits in Oregon during the first year following the war. This would be twice as many as filed during 1938, the heaviest year of unemployment in Oregon and the first year that benefits were paid. These 190,000 claimants would represent more than 50 per cent of the number of workers employed in Oregon at any one time during peak wartime production and would represent probably one-third of the persons who had had any work at all in covered employment during the year preceding the cessation of hostilities.

We do not expect that 190,000 people in Oregon will be without jobs indefinitely after the war—many of them will be experiencing only normal short-term unemployment during the course of the year.

Assuming that the other two coast states will experience a claim load of similar size proportionately, I would say that between 1¾ and 2 million persons will apply for unemployment benefits on the Pacific Coast during the first postwar year. This would be at least double the claim load experienced during the first benefit year.

Western Farm Future . . .

By DEAN WM. A. SCHOENFELD
Oregon State College

FOR the farms of the Far West there is very likely to be after the war, as during the last 20 years, continued appraisal of local possibilities in the light of available markets and the competition of other regions. In the past 20 to 25 years, these Western farmers have greatly changed the character of their farm production.

Producing more than could be consumed in this area, they studied distant markets and shifted their production to those crops which our soils and climate give a competitive advantage. Such wise planning will undoubtedly continue.

With renewed and more permanent industrial activity on the Pacific Coast and with all business stimulated and population increased by commercial relationships with the Orient which seem assured, this region in the course of 10 to 25 years may very likely become a much greater factor in demand for farm production.

An example of this trend is found in my state. The Pacific Cooperative Poultry Producers formerly shipped 95 per cent of the eggs handled to Eastern points. Now, only 5 per cent are shipped out of the trade territory.

When employment decreases, many of the industrial workers now with us who wish to remain in the West will seek acreages for small, often part-time farming ventures. Returning soldiers in large numbers the country over are almost sure to look toward the land. The land supplies a need to these stranded people, but the effect is to reduce market demand and to increase competitive production. Many of these young men will replace older farmers, however. Five years ago, mortgage loan records showed the average age of borrowers to be 50 years.

Farm population has been decreasing since 1915. There was an increase between 1930 and 1935. The percentage of the national income obtained by farmers has decreased since the 1910-1920 period, ranging from a low 5.2 per cent in 1932 to high of 9.1 per cent in 1925. More farmers on the land will tend to decrease still further per capita income of farmers and the percentage of national income received by families on the farms.

To counteract, if possible, this trend toward rural peasantry we may look forward, I am sure, to further organized effort to influence the shaping of helpful political and economic policies which seem necessary, assuming a basis of wise land use and sound production and marketing practices, to bring about a position of improved economic equality for the folks upon the land.

• Today's conferences and drafting boards make tomorrow's contracts and jobs.

Technical Service For Western War Plants

A FREE technical advisory service has been set up by the Smaller War Plants Corporation that makes available to small manufacturers the research facilities of the largest government and industry organizations. Consultants in the regional offices of the West, trained in this type of service, are familiar with the proper sources for the desired information, which has never been within reach of smaller business firms before.

Answers to the problems may be buried in the archives of the Bureau of Standards at Washington, or may be found in the papers of a college professor, in the transactions of a professional society or may be obtained from industrial research laboratories.

For example, answers to a problem submitted to the San Francisco office of SWPC were from the National Bureau of Standards, Washington; Johnson & Son, Racine, Wis.; Utilities Research Commission, Chicago; American Rolling Mill Company, Middletown, O.; Carnegie-Illinois Steel Corp., Pittsburgh; General Motors Corp., Detroit; Hall Lamp Co., Detroit; Sinclair & Valentine Co., New York.

The question was as follows:

"After waxing steel smoke canisters, difficulty is experienced with the rusting of the canisters. Rust appears approximately 24 hours after the waxing operation, and is usually more evident on the inside than outside.

"The canisters, 3 in. in diameter and 4 in. deep, are made of 18 gage steel, bonderized. They are dipped in a water emulsion wax consisting of 20 per cent solid material. The wax used is Johnson Industrial wax, No. 1515C, kept at room temperature or about 5° higher (70° to 75°).

"The canisters are air dried on a conveyor, and the drying process is accelerated by the use of infrared lamps. The local representative of the wax manufacturer suggested a 10 per cent solution water emulsion, which was tried without success; if anything the results were not as satisfactory."

A general construction firm wrote the San Francisco office as follows:

"I am writing to ask your help in getting us some definite information in regard to the use of urea in the bending of wood, and also as a preventive for checking in lumber. We are primarily interested in determining availability of urea for immediate use, price involved and methods of application and effects."

A photo-engraving company had this inquiry:

"We would like to have some information on the etching of steel plates (etched plates). 1. What acid of solution is considered best? 2. What resist holds up best with this particular mordant?

Here is one relating to a new process in furniture manufacturing:

"We would like to obtain information regarding the use of induction heat in the drying of manufactured furniture. In this process, either direct fired heated air is used or steam heated air to accomplish the drying. Some work has been done in connection with the use of induction heating in the furniture manufacturing industry, and any reference you can secure or bulletins which may be available for our use will be greatly appreciated."

Regarding plastics, an inquirer said:

"We know that at the present time a few companies are making tanks and vats from various plastic materials. They are handicapped, however, by the fact that they must make patterns and molds for the various individual members and for that reason are limited in their manufacturing abilities. We are interested in obtaining an acid resisting plastic which is capable of being processed and machined in a manner comparable to the way in which wood is machined."

A manufacturer of brass boxes with chromium plated directly on the brass occasionally found a box on which the chromium seemed to have been eaten away and a coppery mottled surface appeared. His engineers thought possibly the cause was something in the chipboard sleeves packed around the boxes, such as a residue of hydrochloric acid which became active under a slight condition of moist air which attracted the chromium. The condition showed up after standing several months.

Rust protective coatings were sought by a manufacturer of cast iron aircraft piston rings, as the cast iron with such a fine finish was susceptible to very fine rust specks developing during the rusting process. This was despite the fact that all of the operators except those working in oil wore gloves at all times to protect the surface of the rings from sweat and dirt. Protecting the rings with a coating of lanolin between operations was ineffective because it was impractical to apply a very thick film of lanolin.

In all these cases, SWPC was able to get light on the problem from the best sources of information in the country.

This service is not confined to plants doing war work alone, but to all others engaged in essential civilian production.

THE ANSWER

One of the most typical examples of the SWPC technical service is the solution of the problem of a clothing manufacturer who was making trousers for the British army, on a lend-lease contract.

"Apparently, due to some difference in cloth, he finds that production has slowed up throughout his plant because the cloth in these goods causes the needles to heat and the machine must be stopped frequently to cool," was the inquiry that was passed on by the technical service to manufacturers of sewing machines, clothing, button hole machines, etc.

"Is there a special needle for this work available, or is there a harmless method of treating the cloth to prevent this generation of heat?"

Every firm to whom this question was addressed came back with the answer, "Use a chromium plated needle instead of nickel plated," and the problem was solved in short order.

WHERE TO GO

Consultants, Technical Advisory Service, S.W.P.C.

Region 9: Continental Oil Bldg.
Denver 2
Leslie L. Waymire

Region 10: San Francisco 3, Calif.
1355 Market St.
W. Wallace MacLean

Region 13: Seattle 1, Wash.
White-Henry-Stuart Bldg.
William C. Brown

Region 14: Los Angeles 15, Calif.
1031 South Broadway
Stanley W. Ingram

Rivetless Airplanes

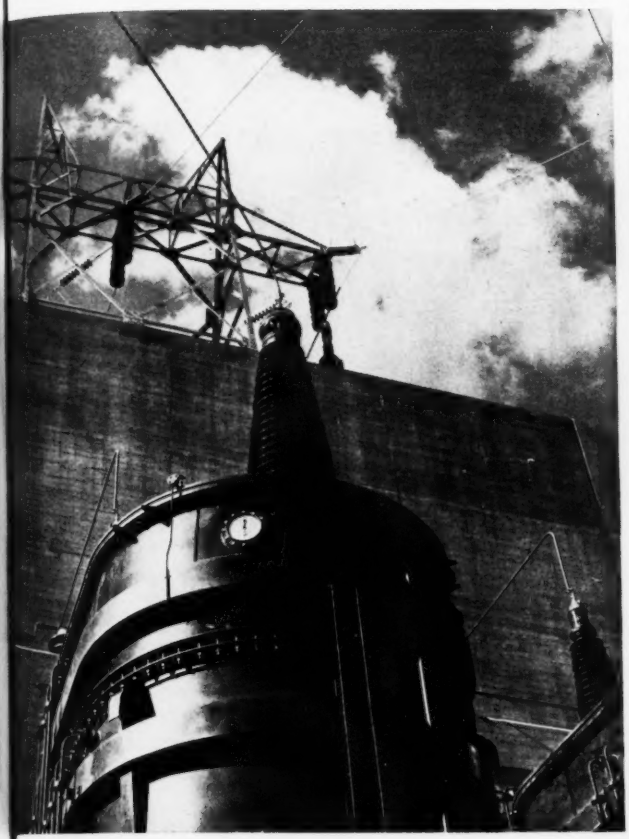
• Elimination of most of the rivets in airplanes is possible with the use of "Cyclewelding," developed by Chrysler Corporation. It is achieved by putting a specially prepared cement on the surfaces to be connected and then applying heat and pressure to the joint. The cement can be brushed on or made in the form of tape and laid on, and the process can be used to unite metal to metal, metal to wood, metal to rubber and metal to plastic. Tests of cyclewelded and riveted metal joints, according to S. G. Saunders, Chrysler production research engineer, show the sheer strength of the former to be almost twice the strength of

der also prohibits the recruitment of women who have been engaged in an essential industry within sixty days of their application for enlistment, unless permission is obtained from the United States Employment Service.

Plywood Plane Doors

• Waist gunners' doors on B-24 Liberators are now being made of resin-impregnated plywood which offers less hazard to personnel, is approximately the same weight as the metal door, and is from 15 to 20 times stiffer per unit weight than duralumin. Wood, impregnated with phenol-formaldehyde resin, actually becomes a new substance, according to Consolidated-Vultee officials.

WESTERN INDUSTRY IN PICTURES



• Huge 36,000 k.v.a. transformer at Grand Coulee Dam, from which an extensive network of transmission lines carry 230,000 volts of electricity to war industries throughout the Pacific Northwest. Giant hydro-electric generators, rated at 108,000 kilowatts each, generate power at 13,800 volts, which is stepped up to 230,000 volts by this transformer, standing 30 feet high and 15 feet wide.

• Optical dividing machine used for controlling diametric and concentric accuracy, dividing a circle into a millionth part for absolute checking of dimensions. It is used for determining the angular accuracy of a Kobe special plug gage in the plant of Kobe, Inc., located in Southern California, manufacturer of precision rings, plugs, gages.

• Banding crates of bundled ammunition at Umatilla Ordnance Depot, Hermiston, Oregon, using Acme No. 2 Steelstrappers. This crate contains three charges for 155 mm. guns for Allied use on far war fronts.

• Near infra-red radiation equipment of Fostoria Pressed Steel Corp. at Myers Barrel Company, Oakland, California. The interior of the drums formerly required 16 hours to air dry, now only 6 minutes.

• Ready service ammunition boxes for the U. S. Navy being manufactured in the plant of Weber Showcase & Fixture Company, Inc., Los Angeles, who were formerly engaged in the store fixture industry but now devote the entire plant facilities to all-out war production.

Time Study of the Job For Your Incentive Plan

By W. J. McLARNEY
Supervisor of Research, Industrial Relations Department, Hughes Aircraft Company

AT PRESENT, when maximum output is demanded for the war effort, and when this section of the state has become a No. 1 critical labor shortage area, a wastage of manpower and machine power cannot be tolerated. Yet, when a worker stands idly waiting for a machine to complete an automatic operation, manpower is being wasted. When a machine idles while waiting for a worker, machine power is being wasted.

Machines and workers must be coordinated so that maximum production is attained. The ideal situation would be that in which both the machines and the workers were kept busy all the time. However, it is practically impossible to achieve this situation. It would be better to favor the situation in which the machines were slightly busier than the operators. But with the increasing scarcity of labor, we can be sure that in the immediate future machines will be waiting for the operator instead of the reverse.

The first step toward reaching our wartime goal of obtaining maximum output is to determine the number of machines of the same type that an operator can attend. This can be approximated by dividing the average handling time into the average machining time for a number of similar jobs. After making this sample calculation, the number of machines per operator should be standardized. Milling machines, and sometimes drill presses, can be set up on the basis of 1 man-4 machines.

Installation of multiple machine operations introduces several new items to be considered in a discussion of wage incentives. A new element called machine awaiting operator, or machine idling, must be incorporated in the time studies.

This new element is timed like any other element. It will vary according to the combination of jobs that are on the machines. However, this element is not added to the other elements in determining the base time. It is omitted from the summation. It is an allowance instead of an element in the processing. To include it in the base time would distort the time study if the number of machines per operator should be changed. It would make it necessary to recalculate each study.

In order to determine a percentage for this allowance — machine idling — determine the ratio of machine idling time to the base time from a good sample of studies taken on machines performing under multiple machine operating conditions. This resulting allowance may be between 5 and 10 per cent.

Despite the increase in the fatigue factor, it is advisable to cut this allowance toward the tight side rather than the loose side because the variable factor—the handling time—becomes very high in relation to the constant factor—the machining time. The reverse is true when one man operates one machine. The machine idling allowance should be added after the standard hours per hundred have been computed on a single machine basis.

The worker is compensated on the basis of the new hours per hundred divided by the standard number of machines to be operated. In the case of the milling machines, the hours per hundred would be divided by four. This must be carefully and fully explained to the operator.

I have used the following illustration: suppose you were operating only one milling machine and getting 40 cents per piece. However, the machine was fixed to operate at its lowest speed and feed with the result that you had to wait around for about a half hour for the piece to be completed. Then it took you two minutes to unload and load the machine. Under such circumstances, no matter how fast you worked, you could not receive as much as 80 cents per hour.

Now suppose the machine was set up to its proper speed and feed so that it completed eight pieces per hour, shouldn't you receive 10 cents per piece instead of 40 cents per piece? Running four machines is equivalent to stepping up the production of one machine. Now, you can work instead of standing around. Now, decreasing the handling time puts extra money in your pocket.

The time study man using the machine idling element can study the jobs in the same manner as when one operator is running one machine. If three of the four jobs on the group of milling machines are already rated, he has only one job to study. If none of the jobs are rated previously, he can, with a little practice, study all four jobs at the same time, using a single continuous watch and four separate time study sheets. This is not very diffcult on milling machine operations, but it will keep him hopping if he tries it on a four spindle drill press.

After the standard of 1 man-four machines is established, it is necessary for the operator to have a separate time ticket for each machine. The time is punched at the beginning and the end of each run. The number of pieces is entered and the money is figured as previously. However, it is necessary to divide the elapsed time on the day work jobs by four. There are more

Resume of first installment of this paper, which appeared in October issue

The structure of a proper incentive plan must have some degree of permanence. If management does not provide the working conditions requisite for standard performance, no incentive plan will work. There must be standardization of the whole job, including the environment, the material, the machine and the operation.

Before time studying specific jobs, management should call all foremen together and explain to them all about time study, especially the method of determining the allowances and calculating the operator's pay and the guaranteed wage.

In selecting operator to be studied, the time-study man should pick a better than average operator to study and set rates on his job exclusively for a week or two, or until the bonus money starts to come in. The time-study man should explain to the worker what he is doing and how the rate per hundred pieces is set. The job must be broken down into its elements, the more the better.

After the study is completed, the time-study man determines the average length of each element after discarding the abnormally high and low values. The summation of the average times of the several elements gives the basic time per piece. This is usually expressed in hundredths of a minute. To this basic time per piece is allowed the personal and fatigue allowances. They generally total between 15 per cent and 25 per cent, varying according to the amount of fatigue involved.

Thus is determined the standard time per piece, which can be readily converted into expected hourly output, or the hours per hundred pieces. This later factor—the hours per hundred—multiplied by the number of pieces completed, equals the number of standard hours multiplied by the occupational rate in cents per hour equals the worker's pay in dollars and cents for the job.

By use of various time tickets, a different one for each of the various jobs the worker performs, his earnings may be computed.

The measure of the productivity of the workers is the ratio of total earned hours—standard hours plus day work hours—to the actual hours. This is the percentage that interests management. The money bonus percentage is the ratio of the actual earnings to the guaranteed wage. This is the figure that interests labor.

• Metal fittings department of the Hughes Aircraft Company, Armament Division, at Culver City, California. Claude Slate, department manager, is shown with Jess Hungerford, foreman, inspecting the work of Mrs. Roma Lowell, a woman employee.

tickets involved, but the week's pay is still the total of the monies on the tickets.

The above system may seem to be a bit cumbersome but its flexibility well outweighs any disadvantages. An operator can have any combination of rated and day work jobs on the machines at the same time. If one of the machines is down for repairs, he carries it along as a day work job. This permits him to concentrate on time, and pick up some extra money.

On the other hand, if it should become necessary for him to operate five machines for a while, he can still earn some extra money because the rates are on a four machine basis; any output on the fifth machine is extra pay. However, the increase in idling time will not make it very profitable for the worker nor desirable for management.

I have found that workers prefer multiple machine operating to single machine operating. In multiple machine operations, many of the irksome inaccuracies and inequalities have a way of counterbalancing each other. A rate that is a bit tight will be compensated for by a rate that is a bit loose. Nor will the operators complain too much if there is a fair sprinkling of day work jobs among the rated jobs. But aside from these minor considerations is the important fact that balanced multiple machine operation accompanied by incentives permits the maximum utilization of manpower and machine power for the war effort.

Under any wage incentive system the emphasis is on output and the worker will sacrifice quality for quantity. Therefore it is necessary to set up tolerances and accept only the piece parts that fall within these limits. If the scrap is excessive, the spoiled pieces should be repaired on the operator's time without compensation. If the pieces can't be reworked, the operator should be laid off for a day or two if it is feasible.

Before concluding, a few words should be said about synthetic rates. They are constructed by recombining the elements of previously taken time studies to form additional standard rates. Standard rates determined in this manner are less costly than rates established by additional time studies. In most cases, if there is a sufficiency of raw data, they are more accurate than a group of time studies because the high and low values are averaged out.

The first step in the construction of synthetic rates is to determine the handling and the machining time for each size in a line of items, such as box wrenches. It is necessary to discover the influence of such factors as length, weight, and perhaps the type of jig upon the handling time of each of the stock sizes already time studied, and project these over the balance of the line of wrenches. If previous time studies cover both extremities of the line and some of the middle items, it is rather easy to fill in the handling time for the remainder.

Machining time can be determined accurately from the standardized speed and feed charts. However, care must be used not to overlook details. In a drilling operation, one half the diameter of the drill must be added to the depth of the hole in order to obtain the actual distance the drill must travel from the time the tip enters the piece until the tip clears the piece at the end of the drilling operation.

The rest of the allowances are made in the same manner as in actual time studies. It is wise to test some of the synthetic rates before dropping in a whole line of standards. Once the rates are published they must not be cut. If the time study department cannot get accurate rates and must resort to rate cutting, it will be much cheaper in the end to hire a new time study department than to pay the cost of the lowered morale that will result in the shop due to rate cutting.

A bonus for the foreman and the other men in the department whose efforts can influence output should be based upon the productivity of the department. This is, as before, the ratio of the total earned hours — standard hours plus day work hours—to the actual hours of the productive workers. The foreman might be paid at the end of each week, 25 cents for each point over 100 per cent that was attained by the department.

The truckers might be paid 5 cents for each point. It is advisable to delay the installation of these bonuses until the system is in good running order, so as to prevent the foreman from using tricks to get loose rates for the purpose of getting high productivity and a fat bonus.

Many a good incentive system has been killed by success. Management, seeing the great increase in output caused by the use of incentives on the production line, demands that the system be extended to cover every one from the janitor to the works manager. In the process of extension, standardization becomes more vague and the measure of output less tangible with the result that all the principles adhered to at the beginning of the installation are violated and the whole system collapses. An incentive wage payment plan is either a success or a flat failure. There is no middle ground.

Magnesium Performance In Aircraft Manufacture

MAGNESIUM castings, forgings and extrusions have been practically 100 per cent satisfactory in aircraft service, while the failures of sheet have been mostly on thin gauges substituted for stronger aluminum alloy on a gauge for gauge basis, according to J. C. Mathes of the Dow Chemical Co. Speaking before the National Aircraft Production Meeting of the Society of Automotive Engineers at Los Angeles Sept. 30, he summarized the experience with magnesium parts as follows:

There are several million pounds per month of sand castings being used in engines, wheels, and airframes. We rarely hear of any service troubles from these. Although not used extensively, forgings and extrusions have apparently given equally as good service.

The case of sheet is somewhat different and practically all instances where magnesium has not done the job expected have been applications utilizing sheet. Many, of course, have been satisfactory and sheet is widely used for oil tanks, wheel fairing, instrument panels, turret parts, miscellaneous cases, etc.

Most of the failures have occurred on so-called non-stressed parts, using thin gauges which, in many cases, have been substituted for the stronger aluminum alloy on a gauge for gauge basis. Such parts, while not primarily stressed, are subjected in many cases to considerable vibration and abuse.

Thin magnesium sheet, perhaps due to its lower ductility and greater notch sensitivity, does not seem to stand this service as satisfactorily. Many of these failures have occurred at points of attachment and in some cases the trouble was overcome by proper edge reinforcement and the use of doublers.

It is apparently the current practice, on aluminum, to reinforce large, flat panels with stiffeners which do not necessarily tie into the main frame. Doors and panels constructed in this manner of magnesium sheet have not worked out and failure has occurred by cracking at the ends of the stiffeners where the vibration is concentrated.

Similarly hinges or fittings which have been attached to sheet and not reinforced at such points by doublers have often failed by cracking. Flooring is another example where conventional aluminum design has not always been satisfactory for thin magnesium sheet. Here the local overloading and impact have sometimes caused premature failure.

Our observation has indicated a satisfactory service experience in both British and German machines for such parts as fairing, cowlings, doors, seats, control surfaces, and fuel tanks. In all cases sheet corresponding to Dowmetal M was used although the minimum gauges were somewhat greater than usual American practice. Very few cases were observed where sheet thinner than .040 was used.

British use of magnesium for warplane gasoline tanks enables them to increase fuel capacity by 12 gallons, save nine pounds in weight, and reduce the "tuliping" of bullet holes which interferes with self-sealing.

Several primary structures have been designed, built and satisfactorily tested both statically and in vibration. In all cases a substantial weight savings was accomplished, particularly in control surfaces where appreciable weight is saved in balance weight.

Only a few of these structures have reached the flying stage but those have been satisfactory so far. The longest service to date is a pair of wings in service over a year and a half and having about 500 hours of flying time.

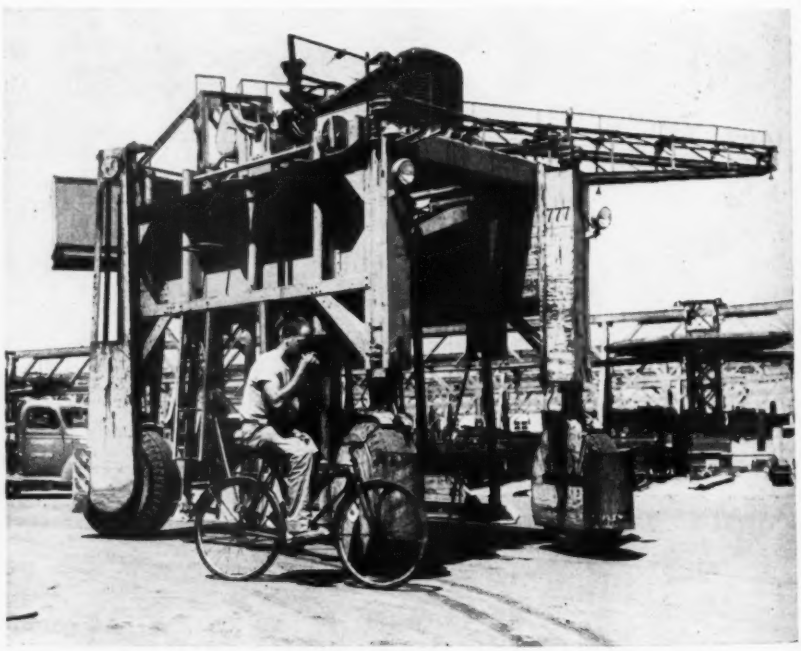
The British are using magnesium sheet as covering for control surfaces and over portions of the wing on some planes. They also have one model, of which about 100 were built in 1939, having the rear fuselage of monocoque magnesium design. A new model also incorporates a similar design.

Following is a tabulation giving the weight comparison of some of the magnesium structures which have passed static and vibration tests:

Type of Plane	*Description of Part*	*Weight*	†*Saving*
Adv. Trainer	Outer wing	153.5	11%
" "	Aileron	16.0	26%
" "	Flaps	5.6	11%
Pursuit	Stabilizer	34.0	24%
"	Elevators	22.7	19%
"	Tail Assem'y*	118.1	13%

†% *Saving as compared to present construction.*

**Incorporates heavier gauge than conventional to reduce number of internal stiffeners.*



• "You're a nice guy, but you're gonna get it," said The Moorship Mariner about this day-dreaming employee. But to avoid such collisions, the California Industrial Accident Commission now requires that on gantry-trucks sold after July 1, 1944, the driver must be able to see a person in the roadway ten feet away. Equipment already in use must conform as nearly as possible. This necessitates elevating the seat, lowering the motor or installing a pancake motor. Other requirements include chain guards, headlights, covered drive shafts and access ladders equipped with handholds.

Post-War Situation Of Aircraft Industry

Here is what will happen in the aircraft industry when the war ends, according to the findings of an Assembly interim committee of the California legislature, after a survey of 1500 airframe and accessory makers:

Thirty-five per cent of the aircraft manufacturers will have to discharge more than 50 per cent of their workers.

Fifty-four per cent will require from 60 days to one year to reconvert or convert their plants to normal peace production.

Forty-two per cent are without reserves of any kind and therefore unable to protect themselves from economic disaster.

Seventy-five per cent are lacking all or part of the reserves necessary for the development of post-war plans.

Twenty-five per cent will be able to proceed with post-war development.

"As aircraft is the largest industry in the state," the committee reported, "and must be the nucleus around which statewide industrialization will be built, the committee is intent upon its preservation to avoid a chaos of unemployment and economic disorganization during the post-war period."

A majority of the manufacturers agree to the committee suggestions for:

1. Establishing an income tax free reserve fund by all aviation manufacturers to provide employment of present employees during the post-war conversion period.

2. Declare a moratorium on California taxes on all inventories and parts involved in canceled war contracts.

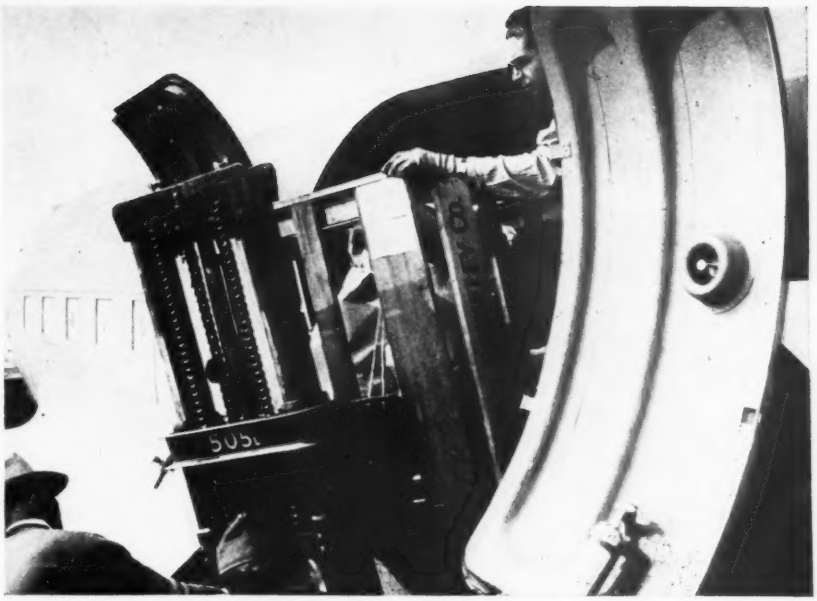
3. Provide that a fixed percentage of unemployed aircraft workers be cared for under the state unemployment fund, through private contractors requiring labor on reconversions of the industry from war to a peacetime basis.

Various complaints were made by the manufacturers against government supervision. Forty-nine per cent believe that government representatives are in general hindering their war production effort and 95 per cent called attention to the fact that this was due to lack of knowledge on the part of government representatives.

Twenty per cent charged them with carelessness and 10 per cent with maliciousness.

War Workers Visit Britain

Stanley Ceizyk of Lockheed Aircraft's force at Burbank, California, is one of four American war plant workers being sent on a month's visit to British factories and U. S. Army installations in the British Isles, at the same time that four workers from British factories will come to this country. The OWI and the British Ministry of Information are jointly sponsoring the project.



Steerer for an LCI invasion boat being shipped from the Webster-Brinkley plant, Seattle, Washington, via naval transport plane to an Eastern shipyard destination.

Value of Supervisory Job Descriptions

One of the most immediate and concrete benefits from working out job descriptions for supervisory employees is proper adjustment of compensation, according to Professor Victor V. Veysey of California Institute of Technology in a monograph entitled "Using Descriptions of Supervisory Jobs." In pointing out that salary inequalities are certain to arise unless compensation is based on a careful study of the duties, requirements and working conditions of jobs, he cited the following instance:

"A company which had undergone extremely rapid expansion undertook an evaluation of its supervisory positions. It was discovered, to the surprise of all, that in the case of eight yard superintendents, all handling similar crews in identical work, the compensation of the highest paid was 100 per cent greater than that of the lowest, and only five of the jobs were being paid within a reasonable range of the proper salary for that type of work."

Properly conducted analyses of supervisory and rank-and-file jobs usually improve employee morale, he stated, but if improperly performed or inadequately explained to the employees, however, job analysis may seriously damage employer-employee relations.

"Older supervisors tend to feel that they know everything about their job," according to Professor Veysey. "They may view any study of their performance by an outsider or by their superior as an unwarranted reflection on their ability to perform the work adequately.

"Investigation of a job may lead a supervisor to imagine that unfavorable changes, or perhaps total abolition of the job, will follow. If this is the attitude of employees or supervisors, it will be difficult to perform a job analysis.

"Extreme care must be used in explaining the program of job analysis to supervisors so that each will understand that the study is directed at the job rather than at the individual and that real benefits to him will result from the study. He must further be assured of a measure of protection against job changes which might damage his status or income."

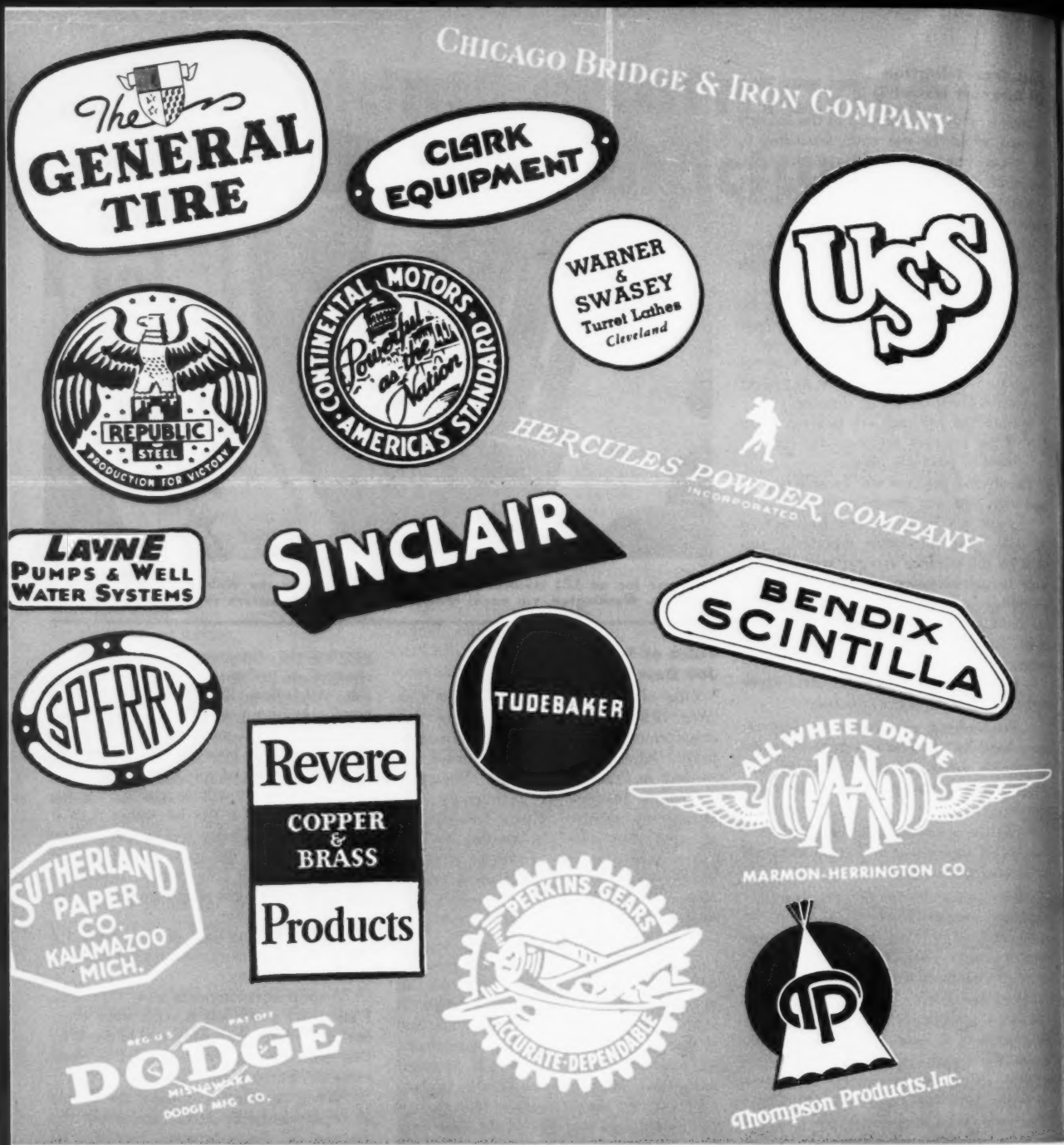
As another instance of the need for complete supervisory job descriptions, he cited the following:

"A shop superintendent said, 'Of course I know what my job is, and what every one of my foremen is supposed to do. Why I've been here 20 years, and I've done every job in the plant!'

"When he was asked about the details of departmental operation and about the division of duties between foremen, he became less certain and more evasive. After the superintendent had gone through the process of analyzing his own, and his foremen's jobs, he was willing to admit, 'Those jobs are certainly a lot different now than when I used to do them.' "

Western Future Portrayed

Industrial possibilities of the West are interestingly set forth in a booklet issued by Merrill Lynch, Pierce, Fenner & Beane, a New York security house, in which the electric power developments, steel, light metals, industrial chemicals and other developments are discussed. It is entitled "The West Changes Horses" and deals particularly with the Pacific Northwest.



It must be apparent to any thinking man that the larger and more prominent the organization, the less it leaves the selection of vital production equipment to mere guesswork and opinion. The fact that the most prominent industrials in America, including those named above, have selected Sullivan Air Compressors is a judgment which *no* buyer who wants the utmost in dependability can afford to overlook. SULLIVAN MACHINERY COMPANY, Executive Offices: Michigan City, Indiana. *In Canada:* Canadian Sullivan Machinery Co., Ltd., Dundas, Ontario.

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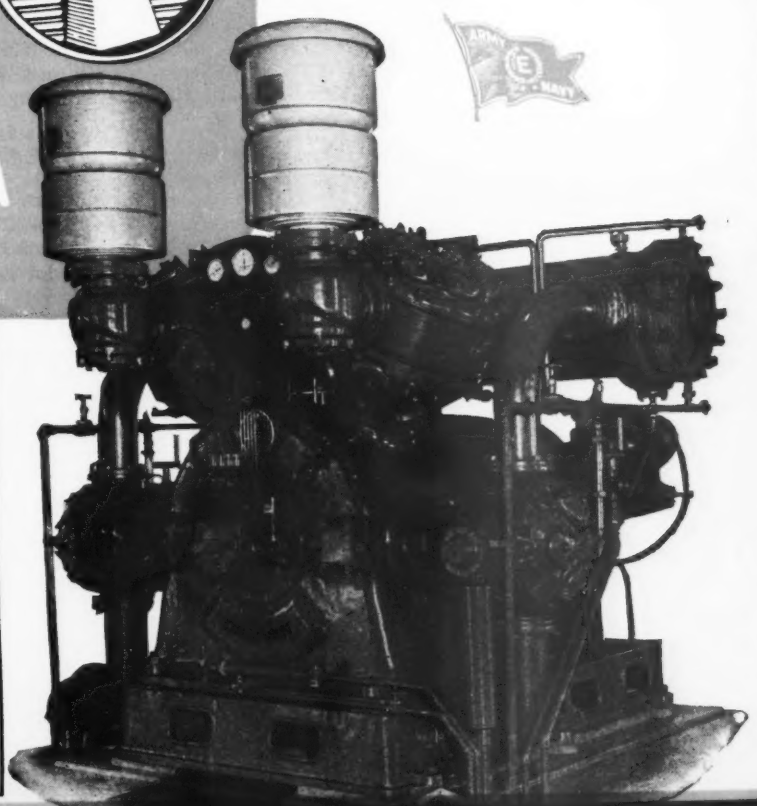

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Job of Selling Washington On the West Still Undone

By ARNOLD KRUCKMAN

WASHINGTON, D.C.—Facts are often unpalatable. If these do not please you, remember this correspondent is only reporting what he has heard, not what he thinks. There is a general idea among the members of Congress —which they probably will not tell you publicly—that you have brought some of the manpower evils upon yourself.

One very good friend of mine "on the Hill" says he has had hundreds and hundreds of letters, and hundreds of calls from people who work in airplane plants and in shipbuilding yards who reiterate with monotonous repetition that they think it is a shame they have to loaf as they do.

Mark, they do not plaster this blame on all plants. There are some, such as the Vultee plant, which constantly are praised for their fidelity to the effort to produce as much as possible with the least possible expense to the government You may recall that the Vultee people came to Washington and told the government they were making too much money.

But, according to the thousands of letters and calls rolling into the Congress, that "cost-plus-fixed-fee" system seems to induce the majority of the big plants to hang on to the workers they have, even though the workers have very little to do. Some of the workers have told their congressmen that they are quitting their easy jobs, and, to salve their conscience, are going to the smaller plants where workers are scarce and where real work is done.

The idea you get here is that the big plants—not all, but some—have too much war-fat and the small plants have too much lean. One congressman after another will tell you, off the record, that it appears those who make the poorest use of the manpower they have, get the advantages, and those who have the least manpower get the worst of it.

Your congressional representatives, as well as others here, who are in places where they should have accurate information, seem to think you have sufficient manpower out there if it were properly used and properly applied.

For instance, when this manpower shock touched the Pacific Northwest, it was found there were 1,100 persons in Aberdeen, Washington, anxious to take jobs; and in Hoquiam, Washington, they found 500. Everett is reported to have a large number eager to work; and they tell us similar stories about Chehalis, Bellingham, Longview, and about Salem, Oregon. We are told there are a substantial number of workers footloose and ready, up along the Columbia river; and there are reports about hundreds of workers in places such as Turlock, in the San Joaquin Valley, and elsewhere in California.

The representatives of the states farther away from the Coast are less interested in the immediate manpower problem because it is not their intimate business, but they readily tell you there is idle manpower back there that could be used.

It seems to be the general thought among the Western delegation, not mentioned usually for publication, that 90 per cent of the so-called manpower problem on the West Coast is a pure fake, and that some unpleasantly frank thought out there might cure a lot of the troubles that have come upon the region. They do not by any means hold that there are no manpower problems, and that they do not require solution, but they seem to think that most of them, probably all of them, might have been solved without the strong-arm action of WMC.

The effect is obvious and serious. Not only are war contracts being cancelled—actually, realistically cancelled—but promising enterprises will be choked off. There is, for instance, the alumina program which had such a splendid start in the Northwest.

WPB had swiftly approved the project. It was scheduled for quick construction with an allocation of materials provided by the tough guys in WPB. But when the WMC came along with its manpower blockade, the gentlemen in the Northwest were told that they could not go ahead because they could not have more manpower in an area already so short of men—and women—that going plants could not be served properly.

Congressman Fred Norman of Washington and Congressman Homer Angell of Oregon and Congressman Henry C. Dworshak naturally presumed they would find sympathetic help among their friends in WPB who had wept much about the shortage of metals. They were finally passed along to Vice-Chairman Charles E. Wilson, sometime head of General Electric, now top man in WPB, while Donald Nelson is visiting the great and near-great in Europe.

Ten other congressmen from the West Slope went along, more or less as a gallery and moral support. To their amazement, Mr. Wilson was utterly unsympathetic. He told them that it would be pure waste to devote materials and manpower on the construction of an alumina plant on the West Coast.

Although Mr. Norman handed him a list of 568 names of persons ready to go to work, a list checked and formally approved by WMC Regional Director Harper, Wilson made it a point to emphasize that manpower was in no way a problem but that there was actually so much alumina and aluminum in this country now that, to quote the picturesque speech of Wilson, "it is running out of our ears."

He rammed the point home by saying that the armed services and other needs were so well guaranteed in their future requirements that they could not possibly exhaust the supply on hand by any stretch of the imagination for over three years.

Mr. Wilson emphasized that WPB had stopped the importation of bauxite ore from which alumina is made from British and Dutch Guiana, because it was not conceivable we could use profitably the great deposits in Arkansas which are adjacent to plants recently provided to manufacture the metal. This information was more than astounding, for we have constantly been told that there is only 2½ years supply of bauxite left in the Arkansas fields.

He threw in for good measure that all this talk about the scarcity of steel is nonsense; that we have abundant steel, *and steel mills and fabrication plants,* for all purposes of the war and civilian needs now in view. This set our Western delegation back on its heels, because, like you and the rest of us, it has been constantly fed on the doleful tidings that we must quit production of badly needed equipment and commodities because there is such a shortage in iron and steel.

They were familiar with the reports from the WPB allocation board which every three months has gloomily announced it was necessary to cut allocations by quantities ranging from 18 to 25 per cent and more. The people from the Hill tried to get some reconciliation between

(Continued on Page 38)

for THIS battle, G.H.Q. is at YOUR own desk!

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Do you know about the new Treasury Department quotas for the current Pay-Roll Allotment Drive? *Quotas running about 50% above the former figures?* You see, these new quotas are based on the fact that the armed forces need more money than ever to win the war, while the average worker has more money than ever before to spend. Particularly so, on a *family income* basis—since in so many families several members are working, now.

Remember, the bond charts of today are the sales curves of tomorrow! Not only will these War Bonds implement our victory—they'll guard against inflation, and they'll furnish billions of dollars of purchasing power to help American business re-establish itself in the markets of peace.

So get this new family income plan working at once. Your local War Finance Committee will give you all the details of the new plan. Act today!

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This Space is a Contribution to America's All-Out War Effort by

WESTERN INDUSTRY

KRUCKMAN *(Cont'd from Pg. 36)*

these facts and the Wilsonian statements, but could not obtain a clarification. They learned also that Congressmen, presumably the bosses, are less important to the gentlemen who run the government agencies than are many others who come from points far afield.

Wilson told them that the Army had cut its order for 140,000 planes in 1944 to 120,000 planes, thereby partly explaining the relaxation of the demand for aluminum. This roused the ire of a congressman who is a member of the Military Affairs Committee. He challenged the statement because he knew the Army had not asked permission to reduce its schedule.

Each of the delegation was stirred by the picture of steel-plenty because WPB had just recently cancelled the Bureau of Reclamation program for a number of irrigation projects in the West which were classified as wasteful of steel for the reason that they would consume 50,000 tons of reinforcing steel, a steel made of scrap, the most abundant of all material.

The general idea here among the Western congressional delegation, and among the persons in government from the West, is that the present plan, so far as it has been revealed, for future war production, will set the clock back for the West. It is generally felt that the manpower problem is superficial. The real tragedy is the cancellation of war contracts.

If the plan is permitted to be carried out as it now is known to us, it would emphasize that the West Coast is capable of sustaining only two major industries: shipbuilding and airplane production. After the brilliant start of the past two years, the other industries, including metal producing plants, heavy and light, would sing into innocuous desuetude, and the whole industrial future of the West would be impaired and checked for many years.

It is this far-reaching effect, contingent upon cancellations, that have followed the declaration of manpower shortages, that has made such deep impression upon the Westerners here. It was the reason why Sen. Pat McCarran, Nevada, joined with Sen. Tom Connally, Texas, in calling a meeting of 100 Western and Southern senators and congressmen early in October.

Mark heavily that this coalition has joined all the States of the West Slope with all the States of the South, as far east as Alabama and Georgia. If the coalition holds together it will have a strong political influence upon the apparent program to choke war industries in the South and the West.

They pulled no punches in their discussion, and they openly charged Eastern cartel groups with fear of the development of steel and other metal resources on the West Slope. The implication was more than an implication that some of your present gloomy prospects may have stemmed from the fear of the Eastern groups that the West may go ahead too fast for Eastern comfort.

It was pointed out that WPB, OPA, WMC, ODT, OES, OEW, WLB, and other agencies with disjointed alphabets, are officered overwhelmingly by men either directly connected with Eastern business, finance, and economic affairs, or men who have natural sympathies for the interests of the East. It has always been notorious here that the men from the South were picked sparingly for war business offices, and that men from the West were so scarce that they stood out like mountain peaks.

The question also was raised why the armed forces seem to assent to the squeeze of Western industrial facilities. The sense seemed to be that it would be logical for the armed forces to oppose the elimination of Western war plants.

If the war supplies must be made farther east, and must be hauled for a week, or ten days, or two weeks, or more, to reach the West Coast, over railroad and highway transportation systems already almost clogged to strangulation, it would seem as though the illogical prolongation in making supplies accessible to the Pacific theater of war might sometimes spell the difference between success and failure.

No one knew why the armed forces had not come to the front for the perpetuation of war industries in the very front yard of the war theater, particularly since it had been announced that there was practically no danger of an attack on the West Coast. The work on the Alaska highway, it was reported, had even been allowed to slow down.

Out of this McCarran-Connally coalition has come a declaration for a drive to preserve local industries in the West and the South. A steering committee will be appointed, consisting of seven senators and seven congressmen. They will plan the strategy of the campaign, and will program hearings to focus attention on the problems, and will develop appropriate legislation to support whatever action is necessary.

In a local way, there is much the same purpose in a committee representing the Northwest, headed by Congressman Norman, Washington. Another committee consisting of the congressional delegation from Los Angeles County and the City of Los Angeles is working on parallel problems in that area.

Among other suggestions, it has requested WMC to make clear why the Smaller War Plants Corporation bureau in Los Angeles is not represented on the Urgency Committee which passes on the need for the supplies and manpower which will enable a business to live.

More congressional action impends in the action suggested by Sen. Joseph C. O'Mahoney, Wyoming, who wishes to make a thorough investigation of the aluminum situation. He wishes to find out why we have suddenly found that we have so much aluminum that "it is running out of our ears."

Apparently O'Mahoney also would go into the puzzling steel situation. It may especially interest you to know that this investigation would have the enthusiastic blessing of Ickes. He already has placed himself on record as suspecting the Eastern groups as the hidden gentlemen in the manpower woodpile.

It is no secret that the Army either has actively begun, or is about to begin, to transfer some of the war industry plants back to Montana and similar areas, on the other side of the Rockies. Someone has said here that the armed forces may anticipate such great need for labor in transportation activities on the Coast when the real war starts in the Pacific that they look favorably upon the war manpower effort to squeeze more manpower out of absolutely unessential industries.

Men like Congressman Jerry Voorhis, California, feel strongly no war industry contract should be cancelled unless it can be indubitably proven the cancellation is absolutely necessary. Mr. Voorhis feels wholesale cancellations now will set the whole West Slope economy back for years. You may be assured that your congressional delegation, not only the representatives from the three Coast states, but the members from all eleven Western states, are earnestly working for your interest in this manpower and cancellation muddle.

It seems only proper to add that they cannot do the whole job. War-time Washington is filled with cries for help, cries that come from Timbuctoo to the tops of the Himalayas. We often think the cries from afar have more potency than the cries from our own people.

If you people of the West Coast and the West Slope really wish to go to town with your fight to retain your place in the war-time industrial sun, and in the permanent industrial picture of the nation, a place you have won with much effort and heartbreak, you should come here as citizens and impress your demands upon the loftiest men in the nation.

The more strikingly and forcibly you make your impression, the better it will be for the efforts your congressional champions are making. Don't come here and wine and dine people. Come here and tell your story in a series of double-page advertisements in the Washington dailies. The very size of such an appeal makes them stop and look. The audacity makes them respect you. And if you tell your story directly, simply, and tersely, it will be read by almost every person of influence in Washington, from the President down. He is an inveterate reader of Washington's dailies. Think it over.

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California Oil Supply Is Safe

California oil fields will be the primary source of supply for the Pacific Coast territory for at least 30 and perhaps 50 years to come, despite the fact that present wartime production demands are eating into the known reserves at the rate of 10 per cent a year, the Interstate Oil Compact Commission was told at its meeting at Santa Fe, New Mexico on Sept. 24 by E. E. Pyles, of the Hancock Oil & Gas Co., chairman of the Production Committee, District No. 5.

The effect of the law of diminishing returns on oil operations makes it impossible to deplete present economic sources of production short of many years, according to Mr. Pyles, who said the California members of the American Association of Geologists felt there were more than three billion barrels of oil yet to be found in California, with the northern half of the San Joaquin Valley, the Sacramento Valley and the Salinas Basin as future possibilities, as well as offshore deposits.

Geologists also estimate that not more than 25 per cent of the original oil content of the present producing sands have been recovered, and that there is a residual crude content which may yield as much as 27 billion barrels. The principal obstacle to this recovery, according to Mr. Pyle, is not the technique of recovery, but rather the problem of educating producers and landowners to the desirability of such procedure and the necessity of unitized or cooperative work.

"Unless, and until, our operators are fully conversant with this problem and are willing to throw into the pot their individual properties for the greater reward of increased recovery, little can be accomplished of a substantial nature," he said.

Extension of the productive life of known pools by means of reservoir repressuring presents difficulties in California not common in many other areas, although some progress has been made in the state.

Columbia Adds To Steel Facilities

One of the largest and most modern foundries in the United States, covering 43 acres, built by the Defense Plant Division of Columbia Steel Company, a U. S. Steel subsidiary, near Pittsburg, California, is now in operation.

The new project, which is located on property adjacent to Columbia Steel Company's Pittsburg works, was constructed at a cost of more than $6,000,000 at the expense and for the account of Defense Plant Corporation. The government has contracted Columbia Steel Company to operate the new foundry for the duration of the war.

When running in full capacity, the new foundry will provide approximately 30,000 tons of steel castings annually. However, a shortage of skilled manpower and the delayed delivery of several installations will retard the foundry getting into full production for several weeks.

Products of the plant will be used primarily by the United States Navy and Maritime Commission. Facilities of the new plant include two 25-ton basic open-hearth furnaces. A six-ton electric furnace is expected to be delivered for installation in a few weeks.

A "U"-shaped structure, equipped with the latest of machinery, the new foundry is so constructed to provide a smooth flow of products. A cleaning bay is located on each side of the "U." One cleaning room is used for smaller materials, while the other bay is used for finishing major castings. The finished products can be moved easily by cranes onto either railroad car or truck. Eighteen electric cranes service the foundry, including two 50-ton, two 40-ton and two 30-ton cranes.

Parts in Leading Role

Sixty-five per cent of the production hours that go into an airplane are in the parts plants while the remaining 35 per cent go into assembly, according to A. J. Brechtel, assistant personnel manager of Plomb Tool Company, in testimony before the House Military Affairs Committee. Aircraft Parts Manufacturers Association reported that 124 of their members are an average of 20.5 per cent behind production schedules, despite an increase of 47½ per cent in number of workers in the past year, and that West Coast parts manufacturers are definitely the sole source of supply for large numbers of critical components ranging from landing gears to valves and instruments.

Navy Repair Center

In line with the increasing importance of the Pacific battle area, Portland is to become a coastal Navy repair and maintenance center, Rear Admiral Edward Cochrane, chief of the Navy Bureau of Ships, has announced.

• LARGEST ALL-WOOD VESSELS since last war are the 20 ocean-going barges built on the Pacific Coast, 274 feet long, 1,700,000 board feet of lumber used in construction of each one. Above is the "Western Larch," from the yards of Anacortes Shipways, Inc.

Explanation of What "Cost-Plus" Means

Clearing up some of the belief that "cost-plus" contracts mean more profits for greater costs, Chas. E. Wilson, executive vice-chairman of WPB, made the following statement on his recent visit to Los Angeles: "Every single plane made on government order is made on a predetermined *estimate of cost* plus a fixed fee."

This statement has been elaborated by one of the government services as follows:

"Nearly all management fees range from five per cent, downward on estimated cost, thus making a definite fee. Estimated cost is arrived at by careful checking, both by management and by the representatives of the government. If, for instance, the estimated cost of an item is $10,000, the management fee, as in many actual contracts now in force, would be between $300 and $500. If actual production costs are $12,000, management does not get one penny more than the fixed fee."

Shipyards also work on an estimated cost and fixed management fee basis; under this type of contract, government cost experts check each item, disallowing any which cannot be supported.

All ordnance department contracts and all foundry work are on fixed price only. There is no cost-plus, or cost-plus fixed fee basis in these contracts.

Practically all aircraft parts production is on a flat contract basis direct with the airframe manufacturers.

Alcoa Deal Dropped

A pending deal for the purchase by the Aluminum Corporation of America of a major interest in Pope & Talbot, Inc., third largest lumber concern in the Pacific Northwest and owners of the McCormick Steamship Company, has been dropped for the present. Pope & Talbot, acting agents for Alcoa, got a much stronger agency arrangement out of it, however. It has been thought likely that Alcoa would transport bauxite from the Caribbean to its aluminum plants in the Northwest and California, using the vessels on the southbound voyage as lumber carriers.

Engine Record Shattered

Joshua Hendy Iron Works of Sunnyvale, California, have completed 500 Liberty ship engines in a period of 25 months. In the last war, the Hendy plant constructed 11 similar engines in the same length of time.

More Denver Rubber

Gates Rubber Company of Denver are planning a postwar expansion program of more than $2,000,000 involving the building of a four-story factory on property adjoining their present plant.

Clearing House For Military Surpluses

Listing of the inventories of used and idle equipment from the surplus stocks of ordnance, air, chemical warfare and all other branches of military and naval services, besides Defense Plant Corporation and other government agencies, with the Redistribution Division of WPB has given the division much greater opportunity to serve industry than ever before. Nearly 100 orders a day for used equipment are being placed through the San Francisco regional office as a result.

Heretofore the armed services have had no clearing house, but have had to check with each other individually. Dealers are also listing equipment with the Redistribution Division.

The Materials Section of the Redistribution Division has had frequent calls for gate valves, steel drums and other containers, barb wire, plywood, and railroad rails, which they have been unsuccessful in locating. They are interested in having surplus stocks of these materials reported to the section.

On the other hand, they are getting large surpluses of perishable tools inventories, aluminum of all kinds, brass pipe and copper tubing, sheet brass, steel and bronze valves, steel rivets and a large variety of certain types of building hardware.

There is a plentiful supply of cold rolled and hot rolled strips and structurals, but still need for steel plates, cold finished bars, large rounds, hexagons and flats and cold rolled steel sheets.

The No. 1 need of the Navy at the present time is for die-lock steel chain for the rapidly expanding LST program, preferably 1 inch and 1¼ inch size. WPB also reports a need for steel and wood tanks, 5,000 to 50,000 gallons, nailing machines, especially those with cleaning attachments, welding equipment, motors, and compressors.

As the result of cancellation of military contracts, there is on hand 4,000 tons of 15/32 inch finished steel plate, approximately 84 x 90 in size, and 2,025 tons of 38 inch diameter circles cut from ⅞ inch flange quality plate.

Pacific Insecticide Institute Meeting

The annual meeting of the Pacific Insecticide Institute was held at the Claremont Hotel, Berkeley, California, on Tuesday, October 12. A business session was held in the morning at which time the new Board of Directors was chosen, together with officers for the ensuing year. Mr. John Paul Jones of the Stauffer Chemical Company, San Francisco Office, was selected as president with Mr. E. T. Doyle of the Tobacco By-Products and Chemical Corp. as vice-president. Mr. Esler Johnson, Pacific Coast representative of the John Powell & Co., Inc., will act as temporary secretary of the Board of Directors. A successor to Dr. E. R. deOng, former secretary-treasurer, will be chosen at a later date. Dr. deOng is now with OPA in Washington.

Among those present were representatives of member firms from Oregon and Washington as well as the University of California and the WPB and OPA offices in San Francisco.

Pork Air-Minded, Not Cauliflower

"The manufacturers are thinking too much about rushing cauliflower from Los Angeles to New York at 300 miles an hour, and not enough about moving pork from Iowa to the West Coast at 100 miles an hour," said Wayne W. Parrish, editor and publisher, American Aviation Daily, Washington, D. C., in his speech "Aviation's Post-War Problems" before the Aviation Forum, Los Angeles.

"Recently I have been in the midwest and frankly I was amazed at the interest of industry in the subject of air cargo, especially among the meat packers in the midwest. They are convinced the airplane is their answer. . . . The industry's engineering brains need to go to work on an honest-to-God cargo plane built for tonnage and utility, not for super-dooper speed. . . . What we need are freight cars with wings."

In the final analysis, according to Parrish, the engineers should go after the mass utility market which is wrapped up in low and slow flying. "The personal owner airplane of the future must land at 30 miles an hour and cruise at from 80 to 120 miles per hour. It must be the Model T—a simple, easily handled old runabout built for service and utility rather than for beauty and high performance. . . . Auto manufacturers who went in for speed and power missed the mass market. . . . It was the Model T that gave human beings the first real flexible transportation medium they ever had in history."

"The postwar challenge then is to produce the aerial equivalents of the Model T and the 1½-ton truck. . . . The challenge remains with management to provide the initiative, and with the engineers to plan for something the public wants and can use."

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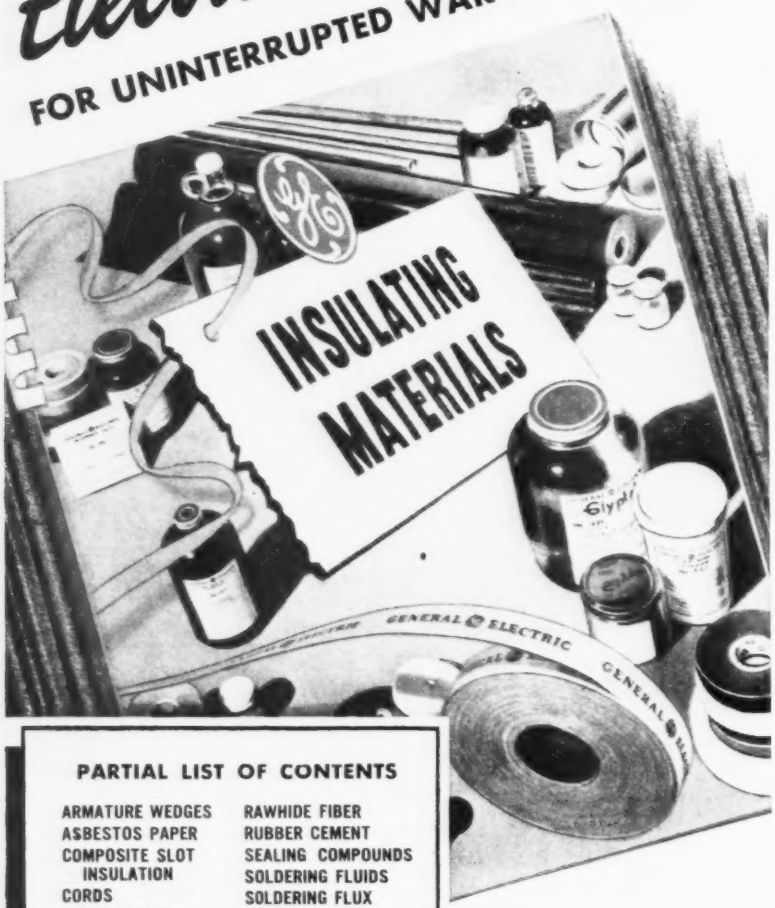

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GENERAL ELECTRIC

Postwar Projects Proposed for Oregon

Tentative projects aggregating a total expenditure of more than $200,000,000 were placed before the Oregon postwar development and readjustment commission last month.

At least seven municipalities in Oregon are creating sinking funds for the construction of sewage disposal plants.

It was estimated that Portland would require $10,000,000 of a total of $12,947,000 proposed for sewage disposal projects in the entire state.

John W. Kelly, executive secretary of the commission, predicted that Oregon shipyards handling maintenance and repairs for navy craft and kindred industries would support 35,000 workers after the close of the war.

The Umatilla Rapids dam, which will require congressional action, was estimated at $30,000,000 and the Detroit dam, also necessitating congressional consideration, $27,650,000.

Kelly predicted that 10,000 men could be used in a proposed $12,000,000 grazing program, provided Congress approves the project in its entirety. Otherwise the state will proceed with such funds as it has available for this purpose.

C.E.D. Estimates

Committee for Economic Development, set up as a representative of industry for postwar planning, have issued what they term their "basic document." It is entitled "Plan Postwar Jobs Now" and contains sets of tables indicating what the national markets for various type of products would be in 1946, arbitrarily assuming full utilization of available manpower, the 1940 general price level and hours of work, with unemployment held to a practical minimum. The study indicates that the country could produce $142 billions of goods and services at 1940 prices, as against an output of $97 billions in 1940, a physical increase of 46 per cent.

Industrial Disputes In 1942

Industrial disputes in California decreased substantially in 1942 from a year of relatively high strike activity in 1941. The number of work stoppages diminished approximately 62 per cent from 384 in 1941, to 147 in 1942, and the number of workers involved decreased 77 per cent from 114,134 in 1941, to 26,309 in 1942.

In normal times, a rise in industrial disputes usually accompanies an increase in industrial activity. The trend of strikes in 1942, however, was inverse to the sharp upward trend in production and employment. This decrease in strikes during 1942 also represented a departure from the usual tendency of industrial disputes to increase during a period of rising living costs.

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As exclusive contractor in its particular industrial area, each "PLANT" Contracting-Unit handles a large and varied volume of heat-insulation jobs—with the happy result that each is enabled to maintain, not just a few, but a whole corps of first-class applicators, headed by a staff of experts who specialize in the field of heat insulation that they know best!

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- *Los Angeles:* 2120 E. 25th Street Tel. Jefferson 3201
- *Wilmington:* 101 Marine Avenue Tel. Wil. 2115

Industries Supply Co.:
- *San Diego:* 345 Fourth Street Tel. Franklin 6201

Asbestos Supply Companies:
- *Portland:* 221 S. W. Front Avenue Tel. Broadway 6547
- *Seattle:* 321 First Avenue South Tel. Eliot 4234
- *Tacoma:* 1926 Pacific Avenue Tel. Main 0183
- *Spokane:* South 10 Bernard Street Tel. Main 4129

WESTERNERS AT WORK...

Arizona

John F. Kinerk, formerly with U. S. Employment Service in Phoenix, has accepted an assignment with the War Manpower Commission in Washington, D.C. James Blessing takes Kinerk's old job. . . . Jack B. Pullen, formerly mine superintendent of the United Verde Branch, Phelps Dodge Corporation, Jerome, Arizona, has been named general superintendent, replacing M. G. Fowler, who was appointed smelter superintendent, Copper Queen Branch, Douglas, Arizona. C. E. Mills, who has been chief engineer in the mine department at Jerome, has taken over Pullen's former duties.

California

C. S. Gross, president, Vega Aircraft Corp., has been appointed vice president and general manager of Lockheed Aircraft Corp. He will continue as Vega president. . . . Harris McIntosh, formerly in charge of production control at Vega, named special assistant to president at Lockheed. . . . Frederick Walker appointed Pacific Coast general manager, and Aubrey M. Callis, assistant general manager, Federated Metals Division, American Smelting and Refining Company. Frank H. Eichler succeeds Walker as Pacific Coast sales manager.

Carl N. Lovegren, president of Canners League of California, has been appointed chief of Pricing Division, Processed Foods, by OPA, Washington, D.C. . . . G. Fred Hogg, formerly technical assistant superintendent at Hercules, Calif., has been appointed sales director of its Naval Stores Department by Hercules Powder Company. . . . A. W. Brown has been elected secretary of The Paraffine Companies, Inc.

Kurt W. Renson has joined Los Angeles laboratory staff, Turco Products, Inc. . . . Ray Sanders, vice president and general manager of Turco, elected president of Los Angeles Automotive Council. . . . William C. Whaley, vice president, Barnsdall Oil Company, appointed general manager, California division.

John G. Walsh and Don J. Russell, vice presidents, appointed to board of directors, Southern Pacific. . . . Nathaniel E. Warman named assistant to chief engineer, Ryan Aeronautical Co. . . . Calvin K. Townsend appointed assistant general manager, Aircraft Accessories Corp.

John J. Jakosky, former dean, School of Engineering and Architecture, University of Kansas, appointed assistant to president of University of Southern California. . . . Harry G. Serlis, formerly general manager Schenley Import Company, appointed sales and advertising manager, Roma Wine Company.

J. D. Zellerbach, president Crown-Zellerbach Company, San Francisco, named on newsprint industry advisory committee by OPA. . . . R. E. Foss appointed general superintendent, operations, California division, Barnsdall Oil Company. . . . Arthur A. Smith elected first vice president, California & Hawaiian Sugar Refining Corp., Ltd., San Francisco.

A. H. Dekker has been appointed procurement manager, Turco Products, Inc., Los Angeles. . . . Roy H. Beaton, formerly assistant general manager, Los Angeles Harbor Dept., has become manager of California Fish Canners, Inc., Terminal Island. . . . F. B. DeLong appointed vice president and general manager of sales, Columbia Steel Company.

Victor S. Herrington has become manager, General Electric Company's Transportation Division, San Francisco, and James H. Williams has been made Transportation Division representative in Los Angeles. . . . E. B. Anderson has been appointed Divisional Manager, Manufacturing Division, Airplane Manufacturing & Supply Corp., North Hollywood. . . . Ralph Thorne, Consolidated Vultee Aircraft Corp., Downey, elected vice president, National Association of Foremen. . . . Lee S. Sinclair, Jr., has been appointed to laboratory staff, Kelite Products, Inc., Los Angeles.

Colorado

Padraic Partridge has joined the operating staff, Union Mines Development Corporation, new unit of Union Carbide and Carbon Corp., with headquarters at Grand Junction.

Idaho

Malcolm C. Brown has been appointed assistant superintendent, Sidney Mining Company, operating in Pine Creek district near Kellogg. . . . William C. Park has been appointed secretary, Idaho Advertising Commission, succeeding L. E. Sargent.

Montana

Cornelius F. Kelley, chairman of the board, Anaconda Copper Mining Company, has received the Charles F. Rand Memorial Medal. He is the second to receive the award, which is made for "distinguished achievement in mining administration."

• Left photo: Production Chiefs: Charles E. Wilson, chairman, Aircraft Production Board; J. H. Kindelberger, president, North American; Frank F. Russell, National Aircraft War Production Council; and T. P. Wright, Aircraft Resources head.

• Right photo: Utah's Committee for Economic Development: seated, left to right, George S. Eccles, Ogden chairman; William J. O'Connor, Salt Lake City chairman; Frederick P. Champ, Logan chairman; standing, Samuel A. Kennedy, Salt Lake City, and CED Regional Manager, Lars Carlson, of Seattle.

Nevada

Joseph A. DeMaie is president and Newton Harlan secretary-treasurer of the newly incorporated Nevada Pershing Tungsten Mines, Inc.

Oregon

Carl C. Webb, Freewater publisher and editor, has been appointed secretary-field manager, Oregon Newspaper Publishers' Association, succeeding Harry Shenk, who has become chief deputy to Secretary of State, Salem. . . . Clay Brown, formerly vice president and manager, plywood division, Smith Wood Products, Inc., Portland, has been appointed assistant to president, U. S. Plywood Corp.

Robert M. Evenden, Portland, has been appointed director, Accident Prevention Division, State Industrial Accident Commission, Salem. . .... Leon B. Baketel, former financial editor, The Oregonian, has become manager of J. Henry Helser & Co. . . . John F. Kilkenny, Pendleton attorney, has been elected president, Oregon State Bar.

Utah

Robert G. Glass of Chicago, former official of Carnegie-Illinois Steel Corp., has been elected a director, vice president and manager of operations of Geneva Steel Company. . . . Peer D. Nielsen has been appointed general superintendent, Clifford G. Strote, purchasing agent and Howard M. Daschback, traffic manager, Geneva Steel Company. . . . Walter Everett Boyden, Salt Lake City, has been named chairman, 8th district, National Board of Pharmacy, and American Conference, Colleges of Pharmacy.

Washington

Paul W. Hand has been appointed manager, Puget Sound district office of Bonneville Power Administration. . . . E. A. Garber, formerly vice president and general manager, Northwest Magnesite Company, has been made president. C. S. Sargent, who was superintendent of mines, succeeds Garber as general manager at Chewelah. . . . Arthur J. Krauss, retired Seattle lumber executive, has been named OPA district manager for Seattle area.

Taylor Greene, head of Currin-Greene Shoe Mfg. Company, has been appointed manager, Seattle district of WPB. . . . N. Henry Gellert, Philadelphia, has been appointed president, Seattle Gas Company, succeeding James F. Pollard who has resigned. Charles M. Sturkey, Rock Hill, S. C., has been made vice president and general manager; Norbert O. Fratt has been promoted from assistant general manager to vice president in charge of sales and merchandising; P. R. Dunbar becomes comptroller; John F. Shaw, chief engineer; and Fred W. Barnum director of purchases, of the gas company.

Henry Rydeen has been appointed personnel manager, and Betty Shaw administrative assistant, Boeing's Renton division. . . . Capt. Harry I. Anderson, marine superintendent, Puget Sound Navigation Company, has been appointed vice president in charge of operations, succeeding James E. Murphy, who has joined the Olson Boiler Works. Captain Anderson's old job has been taken by E. Wood Peabody, and Joel Robbins has been promoted from port engineer to superintendent of maintenance and repair.

Thomas E. Berry has been appointed district manager, Division of Motor Transport, Spokane. . . . George C. Heikes has been named resident manager, Olin Corporation, Tacoma aluminum plant, succeeding M. M. Moser. . . . Tom Gildersleeve becomes manager of the Olympic Hotel, Seattle, succeeding Frank W. Hull. . . . Oliver W. Nelson has been appointed supervisor, newly organized State Department of Public Instruction's division for handicapped children.

Wyoming

Carl B. Hempel, United Air Lines Company, Cheyenne, has been elected vice president, National Association of Foremen. . . . C. L. Fowler, former yardmaster, Union Pacific, at Cheyenne, has been appointed employment supervisor.

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Make Purchase Orders Expedite For You . . .

By JOHN O'ROURKE
Expediter, Pacific Bridge Co., Oakland

"MY PURCHASE order is one of the most important forms in my organization," a leading machine manufacturer told a group of executives at a recent industrial conference. "If I can't buy the materials I need when I need them, I can't supply the tools the War Department needs—when it needs them!"

Behind that statement by one of the key men in the Western war effort lies a long history of forms design which has culminated, during the last two years, in some of the most valuable developments in purchase orders ever made. Even as this executive spoke, most of the men listening to him were devising—or had already devised—purchasing instruments far in advance of the most outstanding forms of twenty-four months ago.

Part of this rapid and widespread development was brought about by war pressures. When the need for vital materials became critical, purchasing agents discovered that poorly designed purchase orders could cause—and were causing—serious delays. Contrariwise, good design was making "expediters" of some purchase orders, not only in their suppliers' organization, but within their own. Everybody, from his receiving clerk to his chief accountant, was grateful to the purchasing agent who provided a complete, well-planned form.

The Exchange Officer of a small San Francisco post exchange was able to take practically all of the paper work out of his warehouse merely by adding a single sheet, with special blockings, to his purchase order. On this same form, he added sufficient accounting information to another sheet to provide for a complete single-surface record of each purchase and simultaneously to simplify his accounting procedure. Many other exchanges have similar forms. One Washington Exchange has printed the entire back of one copy with columns especially for accounting purposes. A San Francisco electrical manufacturer has done the same thing—and added an extra-length sheet as well.

It is not only service organizations who have been blazing this path toward functionalized forms design. By and large, their forms have been simpler than those of the manufacturers who must not only maintain rigid control within their organizations but must also, if they are engaged in war work, make copies and records of all purchases available to a host of government officials and inspectors.

One of our largest drug concerns, an East Bay firm, spent weeks in designing an ingenious seven-part purchase order containing acknowledgment copies, accounting data and extra numerical and alphabetical file copies. This form was in use only a little over a year when the firm had occasion to add more copies.

Such a case history is not as strange as it may seem at a glance. Any growing concern is bound to experience evolution in its forms, as in other phases. To nurse that evolution intelligently is the mark of good management. Combining functions wherever possible, revising existing forms to meet changed conditions, using related forms to best advantage—these are "musts" for complete efficiency.

The growth of related forms, incidentally, is one of the most illuminating facts in the entire picture of the expansion of purchasing forms. A recent survey revealed more than 40 miscellaneous related forms in use by major industries in the West. All of these forms have their uses, naturally, although all of them are seldom found in any one house.

Key related forms include the purchase requisition, receiving record, special (local and other) purchase orders, requests for bid, quotation or inquiry, want lists, change notices, cancellation notices and claims and inspection forms of all kinds.

Again, combination of certain of these forms is not only practicable under most circumstances, but desirable. In Idaho, a large contractor supplying naval training centers combined a requisition for purchase and tabulation of bids in an unusual seven-part snap-out form, by means of which all bids and the bidders making them can be entered on the face of one sheet and carbonized through to the others.

In this way, permanent records are made of the bids and bidders and also of the award, when it was made, to whom and by whom and the reason therefor, as well as any additional special terms. That is one contractor who will never be bothered by government investigations! Other firms have saved extra forms by providing blocks in their requests for quotations or inquiries, in such a manner that a single check mark changes the form to an actual purchase order!

Despite these clever devices, however, and the other various manifolding features of short or strip or die-cut carbons, short sheets or extra-length sheets, blockouts, perforated sections and back printing, which definitely have their places in many forms, there are still some small organizations who can manage to do their purchasing through simple imprinted stock forms.

One Oakland tank and pipe manufacturer uses this type of purchase order to good advantage. This buyer finds that definite specifications as to quantity, prices, description, number of invoices required and exact shipping instructions are conveyed to suppliers adequately through a simple first copy; he retains his duplicate as an office copy for follow-up, checking and accounting work, and he sends a copy with prices eliminated by means of narrow carbon, to his receiving clerk. Space at the bottom of his final copy for disposition data gives him a complete operation.

The purchase orders are bound fifty sets to a book, and each set has only these three copies. *Three copies are all he needs.* His organization is so compact that more copies would be superfluous, perhaps even confusing. Unless new developments dictate addition of copies for acknowledgment, files or other purposes, he will be foolish if he adds them. If new developments do dictate extra copies, however, he will be foolish if he does *not* add them.

Two years ago, a small Los Angeles manufacturer of special machinery, tools, dies, metal stampings and screw machine products was using almost the same type of unpretentious imprinted stock form.

• Beatrice Bates, trained laboratory technician fills finely graduated pipette with aviation gasoline preparatory to a test at Long Beach refinery of Macmillan Petroleum Corporation. Plant was recently converted for production of aviation gasoline for war use.

Today, that firm's purchase order is a *nine part* one-time carbon form, with back printing on two copies and special sections for detailed accounting and receiving data on certain sheets. Parts eight and nine are required by government regulations; one part is an acknowledgment copy to be returned by the vendor, two parts are for the accounting department, one for receiving, two for purchasing files, with an extra copy for follow-up, delivery checks and complete order files.

This form is not unusual. If anything, it is typical of the combined functions which the once simple purchase order is having to perform under our increasingly complex economy.

In addition to combination of functions, considerable emphasis is being put on effective performance of *each* function of the purchase order. Terms and conditions in some industries have begun to resemble the terms of bills of lading. Some attention has been given to standardizing terminology for each item and to proper numerical designation.

The amount of experimentation to provide adequate accounting data has multiplied enormously. Some concerns have given over two entire lines to the sole purpose of indicating routing, and another line to devices for following up on deliveries. The once taken-for-granted method of indicating "confirming" orders has received close scrutiny with the idea of determining whether it is the best method or not. In the aircraft industry particularly, change notices have become more detailed: one large aircraft manufacturer has a five-part one-time carbon form which incorporates a ditto master sheet for still more copies as required.

All of these developments naturally lead to the question of what advantages are to be gained by using them. Purchasing agents give a variety of answers, depending upon their own particular experience. The most common advantage in point of universality, however, is that the buyer's own purchase order gives complete instructions and complete information and prevents misinterpretation of the order, often the source of buyers' headaches.

Protection, both to the buyer in the order itself, and when his books are audited, as well as to the seller, is another frequently mentioned reason for using purchasing forms. Other factors include availability of purchasing facts, freedom from liability, maintenance of production schedules, advantages to accounting, control features—and even the saving of money on freight by specifying inexpensive routing.

The net result of the forward steps being made at this time will certainly be better buying procedures for a post-war world which may need them more than they are needed now.

HOW TO MAKE CUTTING TOOLS LAST LONGER

(NUMBER FOUR OF A SERIES)

TOUGH METALS produce long curling chips that bear steadily on tool faces with extreme pressure. It's hard to keep an oil film on these pressure-loaded tool surfaces and cutting edges. Specially compounded Calol Cutting Oils stick stubbornly, carry the load, lubricate and cool.

MILDER METALS make chips that break shorter. This creates a pumping action that keeps pulling fresh oil onto wear points. Cutting oils with less pressure-resistant compounds can be used. Increase output and lengthen cutting-tool life with Calol Cutting Oils.

FRIABLE METALS crumble into dust when machined. Lubrication is not so important but this waste metal clogs cutting edges. Use Calol Soluble Oil to clean and cool tool and work. There's a full line of Calol Cutting and Soluble Oils—the right type for each of your jobs. Ask your Standard Representative.

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Seattle Analysis of Absenteeism Problem

AN absenteeism survey of 12 plants in metropolitan Seattle conducted by Henry T. Buechel of the College of Economics and Business, University of Washington revealed a rate of 6.34% for the period from June 13 to July 10, approximately the same as a national average of 6.2%. The range was from less than 3% for the lowest plant to nearly 8.5% in the highest. No absences were reported from 53% of the employees, and absences tended to be confined within a minority.

A random sample of 405 workers, every one-hundredth wage earner, showed an absence rate for women 2.2 times that of men and also that 55.3% of the men and 31.5% of the women missed no shifts during the month. Personal illness accounted for 52.8% of the reasons assigned for absence.

"Most important of the basic factors leading to absenteeism is the lack of feeling of urgency in getting out materials for the war effort," reported Mr. Buechel. "Relatively few of the workers expressed any concern regarding the effect of their absence upon war production. In this respect the great majority of us are equally blameworthy. In Britain where whole cities have been destroyed by bombs, wilful absence is a crime punishable by imprisonment; here the war is still remote.

"Again, there was found to be a deep-seated distrust of management in some plants that militates against any feeling of loyalty to the institution or to the production program itself. Most revealing is the important role of the foreman in determining worker attitude. One woman worker who discovered, because of a special assignment, that the foreman is 'just one of us' had an entirely changed attitude thereafter toward the company.

"There is, moreover, the misunderstanding of the role of labor organizations and an antipathy toward forced union membership on the part of workers who expect to be only temporarily engaged in war work or who have come from communities where unionism is practically unknown. Also, relatively high pay makes workers without dependents or a woman whose husband is also employed rather indifferent regarding the loss of a day's income. The weekly 'take' is large even if a day is missed. Finally, many in-migrant war workers have been unable to secure suitable living quarters at what they regard as equitable rates.

"The higher rate of absenteeism among women appears clearly to be due to the fact (1) that they are relatively new in the industrial field and not as fully accustomed, as the male workers, to the routine of regular employment, (2) a large percentage have home duties, the interviews consistently revealing such problems as care of children and shopping and (3) many have no urgent need of income."

Mr. Buechel found that a 48-hour week appears to be near the optimum for efficient production, and that Sunday work is not producing results and should be abolished as far as possible.

Recommendations for action proposed by Mr. Buechel and an advisory committee from the University of Washington and from the Seattle Civilian War Commission, at whose request the study was conducted, were as follows:

1. Pending efforts should be pressed and further means should be sought to obtain an adjustment of what workers consider an inequitable wage award in the aircraft industry.
2. A community-wide committee for controlling absenteeism should be created or an existing committee should be designated to

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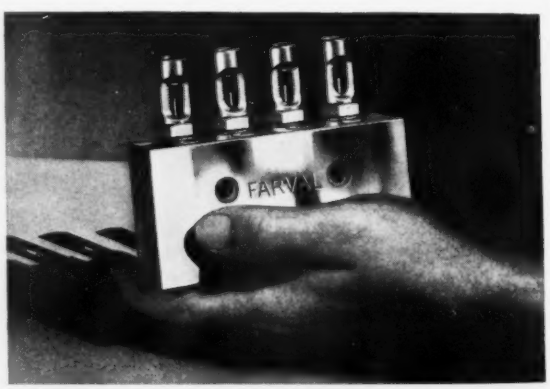

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cope with community problems. Urgent problems to which this committee would address itself are:

a. Support of the efforts being made by transportation and housing agencies to increase existing facilities.
b. Further study of the possibility of adjusting store hours to the needs of war workers.
c. Provision of additional nurseries and child-care facilities.
d. Support of programs, such as that instituted by the American Legion, for giving proper recognition to "presentees."

3. Each plant should set up a labor-management committee to deal solely with absenteeism. This committee should:
   a. Cooperate with similar committees in other plants to obtain adequate standardized records.
   b. Promote educational programs to bring about a greater feeling of urgency in prosecution of the war effort.
   c. Assist management in adjusting the hours and conditions of work of women workers with home responsibilities.
   d. Support specialized training programs for all grades of workers, foremen, and supervisory personnel.
   e. Work toward improving methods of placement, upgrading, and promotion.
   f. Undertake the creation of better relations between management and labor through mutual understanding.
4. Management must assume primary responsibility for:
   (Conditions in the several plants differ widely, making universal application of these proposals impractical or unnecessary).
   a. Scheduling production to minimize idleness or waste effort. If delay is unavoidable, workmen should be told why, since unexplained idleness "takes the heart out" of the worker.
   b. Providing of in-plant feeding facilities. Cafeterias may be run at a loss, and still "pay."
   c. Instituting rest periods, and providing smoking areas.
   d. Scrutinizing lighting and ventilating conditions in the plants. Poor lighting and ventilation were found to be direct causes of personal illness and frequent reasons for worker disaffection, which contributed to absenteeism, and also labor turnover.
5. Labor, on the basis of this study should:
   a. Actively participate in control programs through its own organizations and in cooperation with the proposed labor management committee.
   b. Apply disciplinary measures to members guilty of inexcusable absences.
   c. Support, or inaugurate if not otherwise provided; educational programs designed to impress the worker with his importance in the war effort.

Spokane Gets Big Contract

An initial backlog of $1,000,000 of maritime commission contracts is being brought to Spokane by the Smithway Manufacturing Company, Seattle, who are opening a second plant there to replace the closing of one of their two Seattle factories. The Spokane plant is designed for the inspection and assembly of parts farmed out to small shops of eastern Washington, Idaho, Montana and Wyoming, with casting, forging and machine facilities at Spokane for the manufacture of parts beyond the capacities of the smaller plants.

Build Tank Recovery Units in Montana

Pacific Car & Foundry Company have completed building their last tanks at Renton, Washington, and the plant is now converted to building airplane parts for Boeing. They have now set up a large factory at Billings, Montana, where a new M-26 tank recovery unit is being built. This unit is 58 feet long, weighs 80 tons with a medium tank as the load and will not only take medium tanks aboard by means of winches to save wear and tear in transporting them to the battlefield, but will also load on damaged tanks and take them to the rear.

Kenworth Motor Truck Company, who were considering moving from Seattle to Yakima, had not finally reached a decision at last reports. If they remain in the Seattle area, they will probably have to convert to airplane work.

Contract Cancellation

The War Department has asked Congress for permission, in the case of cancelled contracts, to pay 90 per cent of the cost as soon as the manufacturers can determine the cost, Colonel Bryan Houston told the Aircraft Parts Manufacturers at a meeting in Los Angeles October 11. The War Department wants to provide that if the contractor is overpaid, then he owes the government that overpayment plus 6 per cent.

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• *Industrial Safety, edited by Roland P. Blake.* This book, prepared by men with long experience as active workers in industrial safety, presents an excellent analysis of the principles which must be practiced by every industrial organization. It is useful either as a textbook for safety engineering classes or as a reference book for those responsible for the operation of safety programs. Price $5.00. *Prentice-Hall, Inc., 70 Fifth Avenue, New York, N. Y.*

• *Studies in Arc Welding, Design, Manufacture and Construction.* 98 outstanding papers on arc welding, submitted by trained technicians and engineers in The James F. Lincoln Arc Welding Foundation's 1940-42 Industrial Progress Award Program, have been edited and published in a comprehensive collection of design studies on arc welding. Price $1.50. *The James F. Lincoln Arc Welding Foundation, P.O. Box 5728, Cleveland, Ohio.*

• *Jobs and Security for Tomorrow, by Maxwell S. Stewart.* This pamphlet is a summary of the findings and recommendations of the National Resources Planning Board on post-war jobs and social security. It contrasts the American emphasis on jobs in its post-war thinking with the insurance approach contained in the British Beveridge plan. Price 10c. *Public Affairs Committee, 30 Rockefeller Plaza, New York City, N. Y.*

BMI Valuation

Value of the Defense Plant Corp. plant of Basic Magnesium, Inc., in Clark County has been fixed at $12,749,608 by the Nevada Tax Commission.

The valuation represented a reduction from the previously assessed valuation of $14,499,608 and covers real estate only of the plant corporation.

That Synthetic Smell

Southern California does not seem to be taking to synthetic rubber too kindly. The smell from Southern California Gas Company's butadiene operation has resulted in several shutdowns and finally in a suit filed by the city contending that the exhaust gases constitute a nuisance affecting the municipal hospital.

Reaching Eastward

United States Steel Products Company, a U. S. Steel subsidiary, has contracted to purchase the manufacturing assets of The Petroleum Iron Works Company, a subsidiary of American Republics Corporation. United States Steel Products Company, known as Boyle Manufacturing Company until September 23 when its name was changed, is the Pacific Coast lightweight steel fabricating subsidiary of United States Steel Corporation. The Petroleum Iron Works Company has manufacturing plants located near Sharon, Pennsylvania, and at Port Arthur and Beaumont, Texas.

"Share Parts" Plan

An attempt to avoid bottlenecks in production arising from shortages in certain fittings has been instituted by the Cannon Electric Development Company of Los Angeles. Some time ago a "Criticals" brochure was sent out by the company to various manufacturers asking if they would be willing to advise Cannon of fittings they could spare, thus making them available to others. More than a hundred manufacturers responded to the brochure mailing and since that time a number of concerns holding war contracts have made use of the system.

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Electrical Workers Apprentice Training

International Brotherhood of Electrical Workers, Los Angeles and Oakland, have developed and put into operation an apprentice training program which includes all phases of on-the-job training, a complete list of instructional sheets for related instruction and a thorough record of the activities and progress of each apprentice.

It proved to be so satisfactory that the National Office has adopted it as the basis of a universal apprentice training program for the entire I.B.E.W.

Milk Trucking

Tank trucking of milk is beginning to take hold on the Pacific Coast to a far greater extent than ever before, particularly in the Los Angeles area. Some observers feel that the cost of trucking feed long distances will result in a movement of dairying from the Hynes district adjacent to Los Angeles back to Antelope Valley and the Imperial Valley.

Two-thirds to the Coast

Of the 411 new Victory ships the Maritime Commission has contracted for, 264, or approximately two-thirds, are to be built in West Coast shipyards. Oregon Shipbuilding Corp. will build 104, Permanente Metals Corporation at Richmond, California, 76, and California Shipbuilding Co. at Wilmington, 84. Their speed will be more than 15 knots, about 50 per cent more than the 11-knot Liberties and horsepower of their turbines will be 6,000 or more, as against 2,500 for the reciprocating Liberty engines.

Gliders Canceled

The first major contract to be canceled in the Los Angeles area because of manpower shortage was with Timm Aircraft Corp. for large troop and cargo carrying gliders. The facilities and manpower at the Alameda Street plant are being devoted to sub-assemblies and parts for planes. Timm's plane production at Saticoy continues.

Employment Decline

For the first time since the summer of 1939, an employment decline in the durable goods industries in California in the month of September was registered. The drop brought the figures down to 710,200, the lowest since May, 1943. Seasonal reductions in the canning industry and the reopening of school accounted largely for a drop in total manufacturing employment of 40,700. Average hourly earnings including overtime and extra pay for night shift work, in manufacturing industries as a whole, averaged $1.213 an hour in September, compared with $1.149 in August.

Navy Container Service

To help contractors meet the navy's packaging requirements more easily, the Containers Division of the Navy Department has set up a separate West Coast branch for the 11th, 12th and 13th Naval Districts at 315 Montgomery Street, San Francisco, and after January 1, 1944 will have offices in Seattle and Los Angeles also. Lt. James G. Witte, in charge, was a paper box manufacturer for 12 years and for the last two years before joining the navy was in charge of container work for Montgomery Ward & Co.

Becomes Union Unit

Holding for the first time that the only employee of a concern may constitute a unit for collective bargaining purposes, the Utah LRB designated the Salt Lake Printing Pressmen and Assistants Union No. 148 as the unit for the single pressman employed by the Joe R. Brown Printing Company.

Attendance Pins

Seventy-five employees of Western Gear Works, Seattle, were recently presented with "No Lost Time" pins for having no lost time for any reason in six months. The pins were of sterling silver, and those maintaining perfect attendance for a period of a year will receive gold pins.

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LABOR
AND THE INDUSTRIAL WEST

Warning on Child Labor

Wesley O. Ash, regional director, wage and hour and public contract division. U. S. Department of Labor, has warned employers of California, Washington, Oregon, Idaho, Utah, Arizona and Nevada holding government contracts under the Walsh-Healey public contracts act, that they must conform to child labor provisions of the act or suffer penalties which may mean $10 a day for each day an employee is employed in violation.

The warning was issued on receipt of information that some employers have been violating the exemption permitting employment of girls from 16 to 18 years old by not taking into consideration the following rules:

1) Work must not be for more than 8 hours in any one day.
2) The work period is limited to the hours between 6 a.m. and 10 p.m.
3) Such employees must be paid the minimum wage applicable under the fair labor standards act or Walsh-Healey act to the industry in which employed.
4) A definite lunch period of 30 minutes must be regularly granted.
5) The contractor must obtain and keep on file an age certificate showing the girl to be at least 16 years of age.

In addition no girl under 18 may be employed in any occupation declared by the Children's Bureau of the U. S. Dept. of Labor to be hazardous, and where state laws are more restrictive than the above conditions, they must be met in such employment.

NLRB Hits Unfair Union Tactics

NLRB has ruled that if a worker is discriminatorily discharged because of his union activities, and the board orders him re-employed, it will not order the employer to pay the man for all his idle time unless the man really could not get work during the period he was under discharge.

The discharged man must show that he applied to the U. S. Employment Service for work and that he took work offered him, all within reason. The employer must make good the difference between what the man lost if his new work pay is less or for the time lost in getting re-employment.

Under the old rule, that a discharged man's earnings during the time he worked in a new job would be credited against what the employer had to pay him upon reinstatement, many discharged men remained idle, knowing the board would require the employer to pay them full wages for the whole of the absent period. The war's need for manpower caused this new ruling.

Kaiser Cases Dismissed

Dismissal of the Kaiser Shipyard cases by the NLRB brought to a close one of the most important cases ever brought before the Board on the Pacific Coast.

P. G. & E. Decision

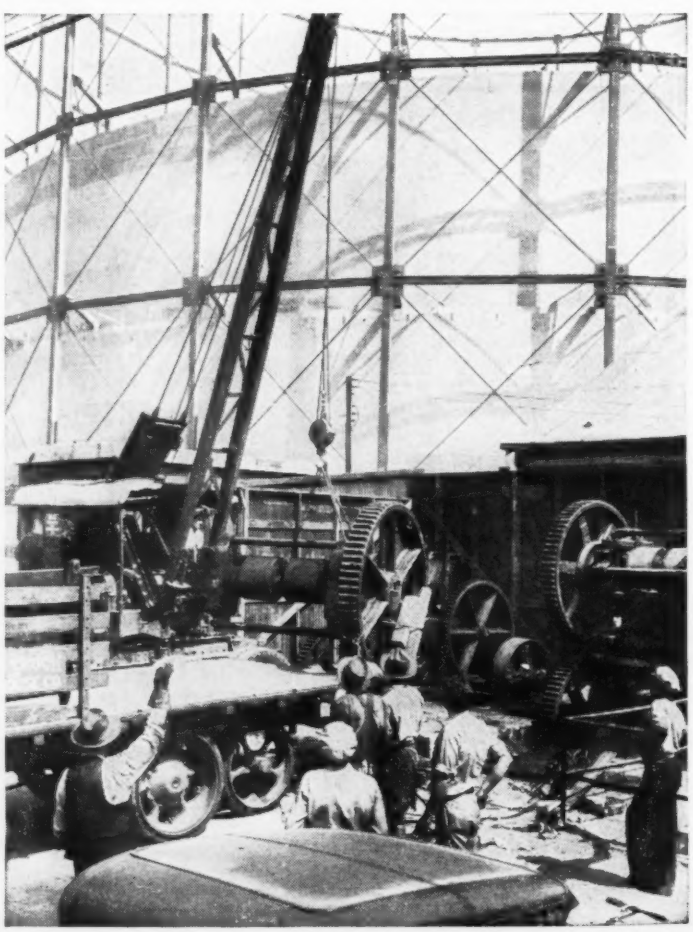
A two cents an hour wage increase for the approximate 2000 employees in the San Francisco East Bay division of the Pacific Gas and Electric Company has been announced by the 10th RWLB. The average rate of the workers was 95.3 cents an hour in January, 1941. Since that time increases totaling 12.5 cents have been granted. The 2 cents ordered by the WLB will bring their total adjustment to 15 per cent.

The Board also directed that the probationary period for new employees be reduced from one year to six months and that the company grant a premium of 50 cents a day to employees for days on which they are on call but do not actually work.

Foundry Workers Pay Raise

10th RWLB has announced approval to wage increases for 4000 foundry workers of Northern California, ranging from 1¾ cents to 15 cents an hour, stating the increases were necessary for effective prosecution of the war. The increase provides that no rates shall exceed $1.28 per hour.

96 tons cast iron and 3000 pounds bronze available for war weapons from Los Angeles, California Gas Company briquet plant load of old machinery.



Marinship Adopts Overtime Plan

Marinship, at Sausalito, California, has adopted a ten minute overtime plan at shift change to standardize production, to continue work done on sequence and to create genuine around-the-clock shift responsibilities.

The regular work day is now 8 hours plus 10 minutes overtime, at time and a half pay. All hourly employees work ten minutes overtime at the end of their respective shifts for the purpose of exchanging tools and speeding up work continuity. The oncoming shift report each day at the usual time. The shift coming off duty transfer their tools to the oncoming shift men at the job site. Each man tells his relief exactly what has to be done to complete the job on which he has worked during the shift. The results of this new program are being watched with interest by the entire shipbuilding industry.

Bay Area Machinery Industry Wage Survey

The San Francisco Bay area wage survey, data available as of March, 1943, shows employees of the first shift averaged almost 54 hours of work a week. There were only five plants in which weekly hours of first-shift employees averaged less than 50; 17 establishments were operating on the basis of two or more shifts. For all plants combined, about 75 per cent of the workers were employed on the first shift, 22 per cent on the second, and only 4 per cent on the third.

Among male workers average hourly earnings, excluding premium pay for overtime and night shift work, ranged from about 78 cents for guards to $1.52 for class A tool and die makers. Rates for female workers, available in only two occupations, show class C bench assemblers average about 76 cents an hour and class A engine-lathe operators about $1.38.

CIO Wins at Trentwood

NLRB has certified the Aluminum Workers of America, Local 38, CIO affiliate, as bargaining agent for production and maintenance employees at the Aluminum Company of America plant at Trentwood, Washington, near Spokane.

Among Labor Personnel

Daniel Jones, swing shift grinder on the ways at Vancouver, Washington, spent August 26, his 100th birthday, at work as usual. Jones was born a slave in Dayville, Alabama. He enlisted during the Civil War and was present when Robert E. Lee surrendered. . . . Mrs. Merle D. Finney is the world's champion welder, male or female, in the opinion of the Chicago Bridge & Iron Company, shipbuilders at Eureka. She has run as much as 145 feet overhead butt weld in one eight-hour shift.

Women Workers in Mines, Mills, Smelters

The International Union of Mine, Mill and Smelter Workers has adopted a resolution giving its full consent to employment of women in mills, smelters and even underground, as a means of relieving the critical manpower shortage. However, J. F. Marble, president-secretary of district 2 of the union, expressed doubt that women will be employed underground, since state laws forbid this.

Officials of Bunker Hill & Sullivan Mining Company, Kellogg, Idaho, report that women employed in their lead smelter and zinc plant are doing so well that more will be hired. The women are employed as kiln feeders, lead calkers, machine operator helpers, baghouse operators, helpers in the slag fuming plant, and also do fence repairing and cleaning of yards.

Absenteeism Cut

In an effort to cut absenteeism in the California plant of The Paraffine Companies, Inc., pictures of employees with high attendance records are posted on bulletin boards throughout the plant on a "War Workers of the Week" display. Further publicity is given over the company's loudspeaker system. Absentee records of this plant have been cut to 2 per cent.

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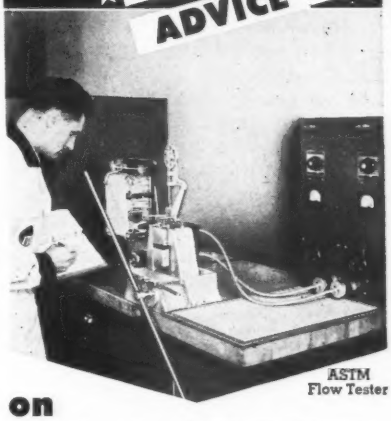

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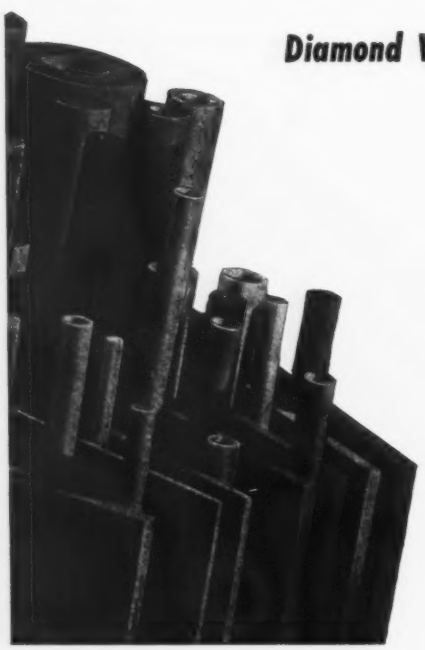
Boys Paid for Airplane Parts

Some 200 boys at James A. Garfield High School, Los Angeles, receive hourly wages from Avion Aircraft Company for constructing small airplane parts after regular class hours in the school workshop under supervision of a factory foreman. In addition they are given shop credit for satisfactory work.

The school district will be reimbursed by the company for the expenses of power, lighting and custodial service. Similar programs may be started at other schools located too far from aircraft plants for students to commute.

Unique Union Pact

Employer-employee relations history added a new chapter when AFL International Ladies' Garment Workers Union, and Coast and Suit Manufacturers' Association, Coat and Suit Jobbers' Association, and Coat and Suit Contractors' Association signed a five-year contract at Los Angeles covering some 3000 employees which requires the employers to pay the union 3 per cent of their gross payroll. The money is to go into a fund out of which the union is to provide vacations for employees, medical and dental care within certain limits and certain old-age pensions, in time.



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$246,800 for X-ray Injuries

About 60 alleged X-ray burn cases have been filed with the Industrial Accident Commission, Los Angeles, by employees of California Shipbuilding Corporation and a total of $246,800 is to be paid in 38 cases settled, which sum does not include thousands of dollars heretofore paid and the estimated medical expense. Their right for lifetime medical treatment is also reserved to the employees.

The trouble started about two years ago when workmen injured while employed by California Shipbuilding Corporation reported to the shipyard hospital operated by Dr. Stellar and associates for treatment and were subjected to various X-ray and fluoroscopic exposures. The cases were eventually diagnosed as excessive X-ray exposure. The money involved in these cases will be paid in part by the California Shipbuilding Corporation, part by their compensation carrier, Liberty Mutual Insurance Company, and part by Lloyd's of London.

Utah Unions Elect

Clarence L. Palmer of West Jordan has been elected president of the Utah CIO and Fullmer H. Latter of Salt Lake City has been re-elected Utah AFL president.

Cannery Workers Receive Wage Boost

Directive order of the 12th RWLB in the dispute of Columbia River cannery operators and employees authorizes pay increase for fishing industry workers of about 15 per cent, retroactive to May 1.

Other features of the order are endorsement of the check-off system for collection of union dues by cannery operators and refusal of a 44-hour week. The established 6-day 48-hour week will continue with time and a half pay for Sundays and holidays and for employees working more than 8 hours in any one day.

WLB Sets Up Airframe Panel

NWLB has announced establishment of an Airframe Panel, composed of members representing labor, industry, and the public, to consider and make recommendations in all dispute cases in the airframe industry involving wage or salary adjustments and a procedure for handling voluntary cases in the industry.

The panel, with headquarters in Washington, D.C., was established after the WLB informed the Regional Boards that all airframe cases, voluntary and disputed, pertaining to the adjustments of wages and salaries are to be sent to the National Board for action in conformance with an over-all wage study made by the Board's Wage Stabilization Division. The panel will make its recommendations to the National Board, which will decide the cases.

WESTERN MARKETERS AND MARKETING

A monthly column devoted to the promotional and advertising plans of western manufacturers

Growth of the industrial advertising accounts of *Royce McCandliss Co.* has necessitated the addition of a new partner to the firm. He is Manford Pate, who for the last 15 years has been affiliated with the *Willamette Hyster Co.* of Portland, manufacturers of materials handling equipment for the logging industry. In recent years he has been sales promotion manager for Willamette Hyster.

Out soon will be a campaign in national trade journals featuring material handling equipment.

After an absence of several months following the death of her father, Edith Curtiss returns to *Pacific National Advertising Agency* to specialize in market research, media, and promotion.

With a background of many years of experience in the creative side of advertising, Joe Perrett goes on his own as Los Angeles' newest agency, the *Joe Perrett Company*. Offices at 5905 Pacific Boulevard.

New production manager for the Seattle office of *Erwin-Wasey Co.* is L. W. Hoffman, one time with the national advertising department of the Seattle P-I.

Keeping step with Southern California's mighty industrial expansion, the Los Angeles office of *Erwin-Wasey Co.* augments its service with an industrial division. Heading it up will be Roy F. Irvin, long a specialist in that type of advertising.

A newcomer to the list of Seattle agencies is Richard D. Whiting's *Standard Advertising Agency*. Whiting has been successively radioman, newspaper manager, agency account executive before embarking on his new venture.

Add new accounts for the *West-Marquis agency*, Los Angeles: *California Spring Co.; Trade Wind Motor Fans; Peerless Electric Products Co.*

New production manager for the *Essig Company*, Los Angeles is Howard Sommer, formerly connected with Western Advertising Artists.

Leo Meehan has been transferred from the Los Angeles office of *McCarty & Co.* to the San Francisco office. He was previously with North American Aviation, where he prepared manuals of instruction, and before that was manager of the Los Angeles office of the Caples Company, handling transportation advertising.

To San Francisco's *Spencer W. Curtiss* agency goes the *National Motor Bearing Co.* of Redwood City, manufacturers of shims and oil retainers. National campaign to be released soon.

Wank & Wank, San Francisco, announce that they have been appointed advertising counselors for *California Corrugated Culvert Co.* of Berkeley, a subsidiary of American Rolling Company.

Consolidated Steel Corporation, Los Angeles, have placed their advertising account with *Foote, Cone & Belding*. Ford Sibley is the account executive in charge of their campaign.

After 11 years of service with Shell Oil Co., eight years of which as editor of *Shell Progress, F. J. Bruguiere* resigns to join the *A. E. Nelson Co.* agency. He will supervise the Leo J. Meyberg account.

Fentron Steel Works, Seattle, announces the appointment of *Ad-Craft Service* to handle its advertising. The company manufactures a complete line of steel sash for both industrial and domestic construction.

Trained in radio broadcasting and outdoor advertising Jerry F. Crollard joins the Seattle office of *Ruthrauff & Ryan, Inc.*, as assistant account executive. Crollard is a member of the American Marketing Association.

Molten Metal Sprayed on Wood Patterns Prolongs Their Life

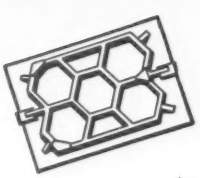
Molten metal sprayed on wood foundry patterns by a compressed air gun provides a protective coating against sand wear on the finished surfaces, thereby prolonging the life of the pattern and eliminating costly repairs.

The metal may be sprayed directly on the untreated wood surface of the pattern or core box. If the wood surfaces are hard or close-grained, a shellac primer is first applied, the metal being sprayed on before the shellac dries. The thickness of the metal coating is about 5 thousandths of an inch.

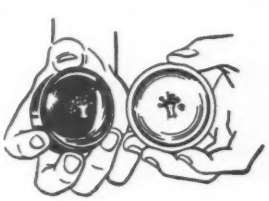
The spraying equipment consists of a portable, self-contained gun-type sprayer which melts the metal and is thermostatically controlled.

We hope this has proved interesting and useful to you, just as Wrigley's Spearmint Gum is proving useful to millions of people working everywhere for Victory.

You can get complete information about this method from Alloy-Sprayer Company, 2039 Book Building, Detroit, Michigan.



This wooden pattern coated with sprayed metal has given service far beyond its normal life.



Fine detail easily recorded in the alloy sprayed onto pattern.

X-56

THE WEST ON ITS WAY

ARIZONA

PLANT—The Donaldson Construction Co., Phoenix, has been awarded contract for enlarging plant of the Mesa Citrus Growers Association.

APARTMENTS—Bailey & McCoy, 1130 Lowell Ave., Tucson, have been awarded contract by Home Owners Loan Corp. for conversion of the North Gate Inn into apartments.

BUILDINGS—Del E. Webb Const. Company, Phoenix, has been awarded $500,000 contract by U. S. District Engineer Office, Los Angeles, for construction of additional buildings at an air field at Yuma, Ariz.

MILITARY INSTALLATION—Basich Bros. Const. Company, Alhambra, Calif., have been awarded $1,000,000 contract by the War Department, for construction of a military installation in Coconino County, Ariz.

BUILDINGS—Jacobson & Wikholm, 1614 Wellington Road, Los Angeles, have been awarded contract by U. S. District Engineer Office, Los Angeles, for the construction of buildings, etc., at Kingman, Ariz.

STEEL WAREHOUSES—J. S. Sundt, 440 S. Park Ave., Tucson, Ariz., has been awarded contract by U. S. District Engineer Area Office, Phoenix, for erection of steel warehouses at a modification center at Tucson, Ariz.

BUILDINGS—King and McKee, 2880 El Cajon Blvd., San Diego, have been awarded contract by U. S. District Engineer Area Office, Phoenix, for construction of additional buildings for prisoner of war camp near Phoenix, Ariz., to cost between $50,000 and $60,000.

MESS HALL—Gilbert E. Olson, Phoenix, has been awarded contract by U. S. District Engineer Area Office, Phoenix, for construction of a mess hall for WACs at Fort Huachuca, Ariz.

CALIFORNIA

GUEST HOUSE—King & McKee, San Diego, have been awarded contract by U. S. District Engineer Office, Los Angeles, for construction of guest house, etc., at Camp Lockett, Campo, San Diego County, Calif.

DISINFESTATION PLANT—Lewis Construction Company, 516-18th St., Oakland, has been awarded contract by U. S. Engineer Office for construction of disinfestation plant in San Francisco Bay area.

HOUSING FACILITIES—O. C. Moroney, 1437 Drake Ave., Burlingame, has been awarded contract by housing facilities in the San Francisco Bay area by U. S. Engineer Office.

BARRACKS—Barrett & Hilp, 918 Harrison St., San Francisco, have been awarded $110,575 contract by Bureau of Yards & Docks, Navy Dept., for construction of two barracks at Naval Air Depot, Mare Island, Calif.

DWELLING UNITS—McCoy and Butler, 1228 F St., Marysville, have been awarded $75,564 contract by Federal Public Housing Authority, San Francisco, for the construction of 40 family dwelling units in Chester, Plumas County, Calif.

LABORATORY—Austin Company, 1001 Ray Bldg., Oakland, has been awarded $600,000 contract for construction of frame and reinforced concrete pencillin laboratory building for Cutter Laboratories, Berkeley, Calif.

ADDITION TO BUILDING—Cahill Bros., 206 Sansome St., San Francisco, have been awarded contract by the U. S. Bureau of Yards & Docks, Navy Dept., for addition to building, Alameda, Calif.

TRANSIT SHED—K. E. Parker Company, San Francisco, has been awarded $109,250 contract by Bureau of Yards & Docks, Navy Dept., for transit shed in Oakland, Calif.

VESSELS—Kaiser Cargo, Inc., Richmond, Calif., has been awarded contract by U. S. Maritime Commission, Washington, D.C., for construction of 12 new type vessels.

PUNCH-LOK

• • • • • *the Easiest, Fastest, Most Dependable and Economical Method for* **SOLVING HOSE CLAMPING PROBLEMS**

The PUNCH-LOK Hose Clamp is a mechanical device for clamping fittings, menders, or ordinary pipe to a hose. A broad, flat, high tensile strength galvanized steel band is double-wrapped around the joint. After tensioning with a pull of 1000 pounds within the LOKING-TOOL, the ends are securely locked together under tension *without loss of tension*. The excess band is then cut off flush with the Lok so that the entire joint is streamlined for safety.

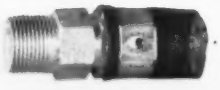
Once the PUNCH-LOK Hose Clamp has been locked, vibration or rough handling cannot loosen it. There is no possibility of injuring or cutting the hose in any way—the clamp will outwear the hose—and the cost is no more than the ordinary clamp of yesterday. Stop your hose leaks and troubles with PUNCH-LOK.

15 SECONDS TIME STOPS COSTLY LEAK LOSS.

Write today to Department B for illustrated folder or contact Harry M. Thomas, Pacific Coast Representative, 1554 Oakland Avenue, Piedmont, California, for the name of your nearest distributor.

• THE BAND
Double-Wrapped

• THE TOOL
Heat-Treated



• THE JOINT
Punch-Loked

PUNCH-LOK COMPANY
321 N. Justine St. Chicago, Illinois
DISTRIBUTORS IN PRINCIPAL WESTERN CITIES

Night and Day

PRODUCTIMETERS
are counting Production for Victory!

Reliable production control means the difference between uneconomical and *profitable operation* . . . between haphazard methods and *intense use* of valuable man-hours. Your machines can *serve better* if equipped with Productimeters! Whether it's counting parts or finished units, measuring cable for Signal Corps use, cloth for parachutes, plywood for planes . . . Productimeters faithfully guard production, check losses, eliminate errors. In 85% of counting applications, a standard style and model will meet the requirements.

Standard models stocked for prompt shipment on West Coast.
Write our nearest distributor for complete information.
Irving G. King & Company, Los Angeles
Mailler Searles, Inc., at San Francisco, Portland and Seattle
Catalog No. 100 on request!

DURANT MANUFACTURING COMPANY
1969 North Buffum Street **PRODUCTIMETERS** Milwaukee, Wisconsin
THE SPEEDOMETERS OF INDUSTRY

DENTAL CLINIC—K. E. Parker Co., San Francisco, has been awarded $45,332 contract by Bureau of Yards and Docks, Navy Dept., for construction of dental clinic at Hunters Point, San Francisco, Calif.

COMMUNITY SERVICE BUILDING—Monson Bros., 475 Sixth St., San Francisco, have been awarded $164,090 contract by Bureau of Yards and Docks, Navy Dept., for construction of community service building at hospital in Alameda County, Calif.

REPAIRS—Frank T. Hickey, Inc., 1111 N. Sycamore Ave., Los Angeles, has been awarded $142,292 contract by the Bureau of Yards and Docks, Navy Dept., for repairing storm damage, erosion control and drainage at Naval Air Depot, Fallbrook, San Diego County, Calif.

OFFICE BUILDING—Davis & Keusder, Los Angeles, have been awarded contract by Western Land & Improvement Co. (Douglas Aircraft Company) for the construction of an office building at 3855 N. Lakewood Blvd., Los Angeles, Calif.

HANGAR—Defense Plant Corporation has announced plans for erection of the largest hangar in the United States at the Los Angeles Airport, to cost about $1,000,000 to be leased to the Douglas Aircraft Co.

DWELLING UNITS—Leo Epp, 4745 Geary Blvd., San Francisco, has been awarded $1,696,361 contract by the Housing Authority for construction of 1,000 family dwelling units in Contra Costa County, Calif.

AIR FORCE INSTALLATION—D. McDonald, 204-23d St., Sacramento, and R. A. Westbrook, 212-13th St., Sacramento, have been awarded joint contract by U. S. Dist. Engineer Office, San Francisco, for construction of an Army air force installation in Northern California, to cost more than $1,000,000.

AUDITORIUM, QUARTERS—Fred J. Early, Jr., 369 Pine St., San Francisco, has been awarded $282,152 contract by U. S. Bureau of Yards & Docks, Navy Dept., for construction of auditorium and bachelor officers' quarters at Pleasanton, Calif.

COMMUNITY BUILDING—S. J. Amoroso Construction Co., 2136 Alemany Blvd., San Francisco, has been awarded contract by the Vallejo Housing Authority for construction of a community building to serve housing project in Vallejo, Calif.

BAKERY BUILDING—Allied Contractors, 9700 West Pico Blvd., Los Angeles, have been awarded contract by U. S. District Engineer Office, Los Angeles, for construction of a bakery building, etc., in Blythe, Calif.

DORMITORY—Harris Const. Co., Fresno, has been awarded $89,480 contract by the Housing Authority of the County of Santa Barbara, for construction of 144 dormitory accommodations at Lompoc, Calif.

HOUSING—Robert McCarthy, 1050 Kirkham St., San Francisco, has been awarded contract for construction of housing in Northern California, to cost over $400,000.

STORAGE FACILITIES—MacDonald & Kahn, Inc., 200 Financial Center Building, San Francisco, have been awarded contract for construction of storage facilities in the San Francisco Bay area.

SHOP—Gorelnik Company, 1220 S. La Brea Ave., Los Angeles, has been awarded contract by U. S. District Engineer Office, Los Angeles, for the construction of repair shop and utilities at Camp Cooke, Calif.

BUILDINGS—Weymouth-Crowell Company, Los Angeles, have been awarded contract by U. S. District Engineer Office, Los Angeles, for construction of buildings, utilities, housing for WACs, etc., at Santa Anita, Calif., to cost between $100,000 and $200,000.

OFFICERS' QUARTERS—Edw. Goral, 416 W. 8th St., Los Angeles, has been awarded contract by U. S. District Engineer Area Office, San Bernardino, for construction of additional officers' quarters at Camp Haan, Calif., to cost between $100,000 and $200,000.

BUILDING—J. K. Thomas & Bever Const. Co., 611 Chamber of Commerce Bldg., Los Angeles, have been awarded contract by U. S. Navy, San Diego, for construction of a frame navigation trainer building, San Diego.

DORMITORY—Lawrence Const. Co., 3020 V St., Sacramento, has been awarded $96,955 contract by Federal Housing Authority, San Francisco, for construction of 36 dormitory accommodations and 20 family dwelling units at Bieber, Lassen County, Calif.

VESSELS—Western Pipe & Steel Co., 200 Bush St., San Francisco, has been awarded contract by the U. S. Maritime Commission for construction of six C-type vessels.

VESSELS—Consolidated Steel Corp., Ltd., Wilmington, has been awarded contract by U. S. Maritime Commission for construction of 32 special-type vessels.

FIRE STATION—Walter J. Unsworth, Los Angeles, has been awarded contract by U. S. District Engineer Office, Los Angeles, for construction of fire station, utilities, etc., at Wilmington, Calif.

STOREHOUSES—Cahill Bros., 206 Sansome Street, San Francisco, have been awarded $497,850 contract by Bureau of Yards and Docks, Navy Department, for construction of two storehouses at Naval Air Station, Alameda, Calif.

Your Chemical Reporter

A philosopher once said that there is nothing so permanent as change. That is especially true of the Chemical Industry—so we bring you, each month in this column, the changes which may effect all industry.

Future Allocation of Sulphuric Acid

Without doubt, sulphuric acid will be placed under allocation in the immediate future. Although the definite plans have not been drawn up at this writing, the procedure will probably follow that for chlorine or other allocated chemicals. The user will file with the War Production Board each month his estimate of what he believes will be his requirements for the following month and must submit this estimate before the 10th of the month to the W.P.B. Washington considers the availability of supply, the use and amount requested for the particular consumer, and allocates either full or partial tonnage to the consumer on or before the first day of the month in question.

Increasing demands upon the sulphuric acid industry by the manufacturers of such vital war materials as aviation gasoline, solvents, and synthetic rubber, have necessitated prompt action by Washington. At this writing, we do not know what industries will be considered the most essential and what industries may be curtailed in their use of sulphuric acid, and for this reason we suggest that any user who may believe he is a borderline case should contact the Stauffer Chemical Company, San Francisco or Los Angeles, regarding the possibility of using spent sulphuric acid as a substitute.

New Prices on Used Drums and Containers

Chlorinated Solvent Users! The O.P.A. has issued a new revision of Maximum Price Regulation No. 43 pertaining to used steel drums, pails and containers effective on October 12, 1943. The regulation, as revised, will be of interest to all purchasers of solvents and other commodities commonly sold in steel containers. It is of special interest to carbon tetrachloride and Zoric Fluid users.

The revision reduces the maximum price ceiling on raw used 55-gallon drums from $1.65 to $1.40 each where shipping and receiving points are both in the states of California, Oregon and Washington. In those cases where either shipping or receiving point is outside these three states, the ceiling price is $1.00. These prices apply f.o.b. consumer's shipping point when non-deposit drums are being returned for credit.

Worth Knowing . . . .

Chemicals Require Particularly Safe Packing

Did you know that the Interstate Commerce Commission, among its various activities, sets up regulations pertaining to the transportation of dangerous articles? They police these regulations through an organization known as the Bureau of Explosives. Their aims are to insure safe packaging and proper handling of all articles which might be hazardous to public transportation.

All poisonous compounds, corrosive liquids, inflammables, or explosives are shipped under strict regulations and the railroads or common carriers are obligated to treat these materials, when bearing the I.C.C. stamp, with care and respect.

No doubt you have seen an acid carboy. Did you realize that the bottle was packed in its wooden box and cushioned in such a way that if a freight car moving at twenty miles an hour should strike an immovable object it would withstand the shock without breaking? Have you noticed the clay stopper wired onto the top of the carboy bottle? This clay is especially compounded and baked so as to have sufficient porosity to allow the passage of any fumes in order to prevent the accumulation of pressure within the bottle and yet be tight enough to prevent the liquid from pouring out if the bottle is on its side.

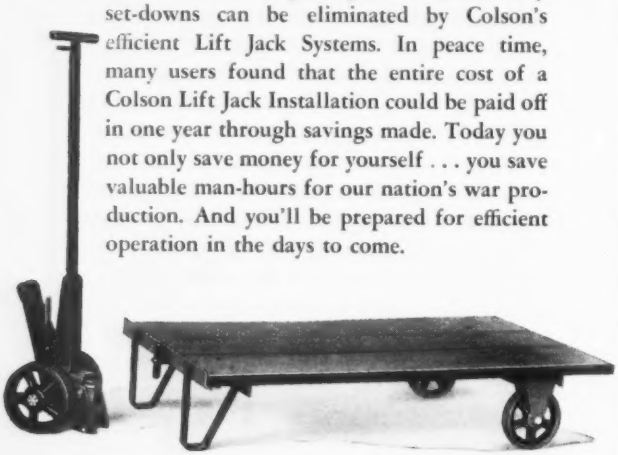
The I.C.C. regulations definitely state the strengths of acids which may be put into specified types of containers, and how each container shall be constructed. Although an acid tankcar looks just like an oil tankcar, you will note that it has no bottom outlet inasmuch as the I.C.C. does not want to risk the chance of knocking off the bottom valve and thereby pouring dangerous acids along the railroad right-of-way.

Various colored labels are used to denote different types of dangerous compounds. When you see a red label it means an inflammable liquid; a white label, a corrosive liquid; a yellow label, a solid either of an inflammable nature or one likely to cause spontaneous combustion if exposed to certain conditions. And there is the green label for non-inflammable compressed gases. Then there are variations of these other labels, such as the red label for inflammable gases or fireworks, the red label for explosives, the yellow label for poisons, and, in addition, various other combinations for specialty items. All these serve as "flags" to warn you of danger. When you see one, remember, TREAT THE PACKAGE WITH RESPECT!

Your Chemical Reporter will bring you helpful chemical information each month through the courtesy of Stauffer Chemical Company, San Francisco, Los Angeles and North Portland.

COLSON Lift Jack Systems
Speed Handling at Low Cost!

EXTRA HANDLING COSTS MONEY. Unnecessary pick-ups and unnecessary set-downs can be eliminated by Colson's efficient Lift Jack Systems. In peace time, many users found that the entire cost of a Colson Lift Jack Installation could be paid off in one year through savings made. Today you not only save money for yourself . . . you save valuable man-hours for our nation's war production. And you'll be prepared for efficient operation in the days to come.



Two units make up a Colson Lift Jack Installation—a platform or live skid with wheels on one end and legs on the other; a twin-wheeled jack that engages the front end and converts it into a sturdy, easy-to-roll truck. One jack will serve many platforms. With these two units, materials and parts are always completely mobile, while taking up no more space than the area of the load.

In your need for faster movement from raw material to finished product, ask us to show you how Colson equipment can help you.

COLSON
EQUIPMENT & SUPPLY CO.
LOS ANGELES SAN FRANCISCO
Material Handling Equipment

THE WEST ON ITS WAY

CONSTRUCTION—R. J. Daum, 6803 West Blvd., Inglewood, has been awarded $105,341 contract by the Bureau of Yards and Docks, Navy Department, for construction at El Centro.

STOREHOUSE—Dinwiddie Const. Co., Inc., San Francisco, has been awarded contract by Bureau of Yards & Docks, Navy Dept., for construction of temporary storehouse on Treasure Island, Calif.

HOSPITAL FACILITIES—MacDonald & Kahn, Inc., San Francisco, have been awarded $1,290,700 contract by Bureau of Yards & Docks, Navy Dept., for construction of hospital facilities at Pleasanton, Calif.

FACTORY BUILDING—McNeil Const. Co., Los Angeles, has been awarded contract for construction of factory building for the B. F. Goodrich Company at 5400 E. Olympic Blvd., Los Angeles.

BUILDING—Willis F. Lynn, 1037 Ashmount Ave., Oakland, has been awarded contract by U. S. Engineering Office, San Francisco, for construction of building in San Francisco Bay area.

BUILDING—Younger Const. Co., San Anselmo, has been awarded contract by U. S. Engineer Office, San Francisco, for construction of building in San Francisco Bay area.

COLD STORAGE FACILITIES—Howson Bros., Gilroy, have been awarded contract by U. S. Engineer Office, San Francisco, for construction of additional cold storage facilities in Central California.

COMMUNITY BUILDING—R. J. Daum, Inglewood, has been awarded $34,445 contract by Federal Public Housing Authority, San Diego, for construction of community building at a housing project in National City, San Diego County, Calif.

HOUSING—Mattock Const. Co., 212 Clara St., San Francisco, has been awarded contract by U. S. Engineer Office for construction of housing in the San Francisco Bay area.

COLORADO

WAREHOUSE—Johns Engineering Company, 3708 Ames St., Denver, has been awarded contract by U. S. Engineer, Denver, for construction of warehouse and utilities, Denver, Colo.

BUILDINGS AND UTILITIES—Maxey and Leftwich, Denver, have been awarded contract by U. S. District Engineer Office, Denver, for construction of buildings and utilities at a prisoners' camp in Weld County, Colo.

IDAHO

BUILDINGS—Brennan & Cahoon, Burley, Idaho, have been awarded contract by U. S. Engineers, Portland, for construction of additional buildings in Minidoka County, Idaho.

BUILDING—Frank P. Kleopfer, 416 S. 6th St., Boise, Idaho, has been awarded contract for building construction in Elmore County, Idaho.

DWELLING UNITS—Merrill & Launch, Helena, Mont., have been awarded contract for construction of 80 family dwelling units at Mountain Home, Idaho.

DISPENSARY—Anderson Bldg. Company, Spokane, has been awarded $416,260 contract by the Bureau of Yards & Docks, Navy Dept., for construction of additions to dispensary and new dispensary for out-going group, Navigation Training Station, Farragut, Idaho.

MONTANA

PLANT FACILITIES—The Domestic Manganese and Development Company, Butte, Mont., has executed contract for installation of plant facilities to cost about $250,000.

NEVADA

CONCENTRATING PLANT — Maurice Constant, Sulphur, Nev., manager of Constant Minerals Separation Process, Inc., has applied for priorities for construction of a concentrating plant for recovery of quicksilver, tungsten and gold from the Rabbit Hole placer ground.

DORMITORY UNITS—Cal-Vada Construction Company, Reno, has been awarded contract by the Sparks Housing Authority for construction of 60 dormitory units in Sparks, Nev.

BUILDINGS—Stolte, Inc., 1405 San Antonio Ave., Alameda, and MacDonald & Kahn, Inc., 200 Financial Center Bldg., San Francisco, have been awarded contract by U. S. Engineer Office, Sacramento, for construction of buildings in Nevada.

OREGON

SHIPS—Commercial Iron Works has been awarded Navy shipbuilding contracts amounting to about $30,000,000.

LIBERTY SHIPS—Oregon Shipbuilding Corp., Portland, Ore., has been awarded contract by U. S. Maritime Commission, Washington, D.C., for 53 additional Liberty ships.

BUILDING—R. E. Settergren, Portland, has been awarded contract by the Bureau of Yards and Docks, Navy Dept., for construction of night lookout trainer building at receiving barracks, Portland, Ore.

BUILDING ADDITIONS—Halvorson Construction Company and H. Halvorson, Salem, Ore., have been awarded contract by the War Dept. for additions to a temporary frame building in Jackson County, Ore.

BUILDINGS—C. T. Malcom & Co., 7909 Halsey St., Portland, have been awarded contract by U. S. Engineers, Portland District, for construction of buildings, etc., in Benton County, Ore.

BUILDINGS—W. C. Smith Co., L. H. Hoffmann and Howard S. Wright and Co., Portland, have been awarded contract by U. S. Engineer Office, Portland, for construction of temporary frame buildings in Deschutes County, Ore.

BUILDINGS—Halvorson Construction Company and E. B. Halvorson, Salem, have been awarded contract by U. S. Engineer Office, Portland, for miscellaneous buildings in Deschutes County, Ore.

TRAILER CAMP—Beckett, Bridges and Welcer, 808 Lewis Bldg., Portland, have been awarded contract by the Federal Public Housing Authority, Seattle, for construction of a 50-unit trailer camp in Sweet Home, Ore.

TOWBOATS—Astoria Marine Construction Company, Astoria, Ore., has been awarded contract by U. S. Maritime Commission, Washington, D.C., for fifteen towboats.

BUILDINGS, etc.—Edwin E. Batterman, Salem, has been awarded contract by U. S. Engineer Office, Portland, for construction of buildings, remodeling, painting, etc., in Benton County, Ore.

TRAILER UNITS—Beckett, Bridges & Welcer, Portland, have been awarded contract by Federal Public Housing Authority to construct 30 trailer units at Sweet Home, Ore.

MANUFACTURING FACILITIES—Westinghouse Electric & Mfg. Co., Manufacturing and Repair Division, has purchased ground, buildings and machinery, costing about $100,000, from Harris Ice Machine Works, Tillamook and Kerby Sts., Portland, Ore.

DORMITORY UNITS—Beckett, Bridges & Welcer, 808 Lewis Bldg., Portland, have been awarded $189,753 contract by Federal Public Housing Authority, Seattle, for construction of 100 temporary dormitory units in Sweet Home, Ore.

UTAH

INTERNMENT CAMP—Daley Bros., 426 Bryant St., San Francisco, have been awarded contract by U. S. District Engineer Office, Salt Lake City, for construction of a prisoner of war internment camp at Tooele, Utah, to cost between $200,000 and $300,000.

BUILDINGS—U. S. Engineer Office, Salt Lake City, has authorized construction of four buildings at Dugway proving ground, Tooele County, Utah, to cost more than $70,000.

BUILDINGS—R. J. Daum, Inglewood and Salt Lake City, has been awarded contract by U. S. District Engineer Office for construction of additional Army buildings at the Army airbase, Salt Lake City, Utah, to cost between $200,000 and $300,000.

HOUSING—R. H. Parr, 503 Beason Bldg., Salt Lake City, has been awarded contract by U. S. District Engineer Office, Salt Lake City, for construction of additional Army housing facilities at Kearns, Utah.

WASHINGTON

BUILDING—Olaz Boen, 703 E. 39th St., Seattle, has been awarded contract by the Navy Department for construction of a building on Whidby Island, Wash.

HOUSING UNITS—Sullivan, Lynch & Hainsworth, 1822 McGilvra Blvd., Seattle, have been awarded $200,000 contract by U. S. Army Engineers for construction of housing units and installation of sewer system in Clallam County, Wash.

STEEL

What You Want... When You Want It

★★★★★★★ **Warehouse Service**

Keep production rolling. Save time. Take advantage of the improved stocks of MILD STEEL BARS and BANDS, PLATES, STRUCTURAL SHAPES, HOT ROLLED and GALVANIZED SHEETS, CARBON and ALLOY STEEL BARS now on hand in our warehouses and available for immediate delivery. Monthly stock list mailed on request.

★★★★ **Cold Finished Steel Bars**

Get speedier deliveries of highest quality carbon and alloy Cold Finished Steel Bars in all S.A.E. grades direct from our Cold Finished Steel Division, operating the only Cold Finished Bar Mill on the Pacific Coast.

ROUNDS • SQUARES • HEXAGONS • FLATS

Phone or Wire your requirements. Chances are, we have it in stock.

PENNSYLVANIA IRON AND STEEL Company

2451 EAST 23RD STREET PHONE KIMBALL 1211 LOS ANGELES, CALIF.

THE WEST ON ITS WAY

REDECKING FERRY TERMINAL—Sound Construction and Engineering Company, Northern Life Tower, Seattle, has been awarded contract by King County Commissioners for redecking Vashon Island ferry terminal.

WAREHOUSES—The Sound Const. & Engr. Co., Seattle, and Ford J. Twaits Company have been awarded contract by U. S. Dist. Engr. Office, Seattle, for construction of warehouses in Spokane County, Wash., to cost about $50,000.

HOUSING UNITS—Bergesen, Wick & Dahlgren, Tacoma, have been awarded $170,000 contract for construction of 100 housing units at Longview, Wash.

TRANSIT SHEDS—The Western Construction Company, Seattle, has been notified by the Seattle Port Commission to construct two large transit sheds on the north pier of the Connecticut Street terminal to cost $561,157.

RESIDENCES—The Waale-Camplan Company, Portland, has been awarded $3,300,000 contract for construction of 604 private residences in Spokane, Wash.

CONSTRUCTION—McAtee & Heath, Spokane, have been awarded $500,000 contract by U. S. Engineers for additional construction in the Ephrata area, Grant County, Wash.

BUILDINGS—Rainier Construction Co., Seattle, has been awarded contract by U. S. Engineers for construction of buildings at Fort Lewis, Pierce County, Wash.

MILITARY INSTALLATION—Ford J. Twaits, Los Angeles, Morrison & Knudsen, Los Angeles, and Sound Const. & Engr. Co., Seattle, have been awarded joint contract in excess of $1,000,000 by the U. S. District Engineer Office, Seattle, for Army construction at a military installation in King County, Wash.

DWELLING UNITS—Gregesen, Wick & Halgren, Tacoma, have been awarded $170,000 contract for construction of 100-family temporary dwelling units in Longview, Wash.

STORAGE FACILITIES—Johnson, Goetz and Brennan, 208 E. Pacific St., Seattle, have been awarded contract by U. S. Army Engineers for storage facilities in King County, Wash.

CONSTRUCTION—Axel Osberg, 502 N. 62nd St., Seattle, has been awarded $90,000 contract by U. S. Army Engineers, Seattle District Office, for additional construction work in Snohomish County, Wash.

CONSTRUCTION—Sound Construction and Engineering Company, Northern Life Tower, Seattle, has been awarded contract by Seattle District Office of U. S. Army Engineers, for additional construction in King County, Wash.

DWELLING UNITS, etc.—The Halvorson Construction Company, First National Bank Bldg., Salem, Ore., has been awarded $219,400 contract by Seattle Federal Public Housing Authority, for construction of an 80-family dwelling unit and 36 dormitory units in Metaline Falls, Wash.

HOUSING UNITS—Daniels & Turnquist, Seattle, have been awarded contract by Public Housing Authority, to construct 20 temporary housing units and a small community building at Forks, Clallam Co., Wash.

HOUSING UNITS—R. D. Merrill Construction Company, Helena, Mont., has been awarded $92,250 contract by Federal Public Housing Authority, to construct 40 housing units and a community structure at Northport, Stevens County, Wash.

VESSELS—Anacortes Shipways, Inc., Anacortes, Wash., has been awarded contract by U. S. Maritime Commission, Washington, D.C., for four wooden freight and passenger vessels equipped with diesel engines.

BUILDINGS—Hazen & Clark, Welch Bldg., Spokane, have been awarded contract by U. S. Dist. Engineer, Seattle, for additional buildings to be built in Spokane County, Wash.

ADDITIONAL CONSTRUCTION—C. M. Ludberg, W. 326 First Ave., Spokane, has been awarded contract by U. S. Army Engineers for additional construction in the Ephrata area, Grant County, Wash.

BUILDING AND MESS HALL—C. M. Ludberg, Spokane, has been awarded contract by U. S. Army Engineers for construction of administration building and mess hall in Grant County, Wash.

BUILDINGS—Frank Lohse, 110 Eighth Avenue, Seattle, has been awarded contract by U. S. Engineer Office, Portland, for construction of temporary frame buildings in Walla Walla County, Wash., to cost about $60,000.

WAREHOUSES—Woodworth & Co., Inc., and the Macdonald Bldg. Co., Tacoma, have been awarded contracts for construction of several warehouses at a military installation in King County, Wash.

BALL NICE BEARINGS

TRADE MARK REG U S PAT OFF

NICE Single Row Ground Radial Bearings

In addition to Nice, Edward D. Maltby Co. is engineering representative for leading manufacturers of Industrial, Automotive and Aviation Bearings—AMERICAN—RBC—SHAFER—and distributor of Timken Roller Bearings.

M-R-C — NICE — MINIATURE PRECISION — Ball Bearings. CYCLOPS — 20th CENTURY — Needle Bearings. WHITNEY ROLLER CHAINS — RANDALL PILLOW BLOCKS — and PERFECT OIL RETAINERS.

Write for Bulletin 43-F

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Downs Crane Wheels are furnished in Pin and Keeper, Plain and Live Shaft types in tread diameters from 7½" to 24" inclusive. Wheel load capacities to suit any condition. Full roller bearing wheel assemblies are ready for mounting in crane end trucks. Also available with bronze bushings or any type of ball or roller bearings for any style of mounting.

Send for Bulletin No. 3200 with complete specifications

DOWNS CRANE & HOIST CO.
540 WEST VERNON AVE., LOS ANGELES, CALIF.

MESS HALL—Hawkins & Armstrong, 5265-16th Ave., N.E., Seattle, have been awarded contract by U. S. Army Engineers for construction of mess hall in Spokane County, Wash.

DORMITORY—H. R. Olsen, 4040 Pacific Ave., Tacoma, Wash., has been awarded $282,800 contract for construction of 504-bed women's dormitory for Boeing workers in Seattle, Wash.

CONSTRUCTION—Sound Construction and Engineering Company, Seattle, has been awarded $200,000 contract by U. S. Army Engineers, for additional construction in Clallam County, Wash.

QUARTERS—Gaasland Construction Company, Bellingham, has been awarded contract for quarters for WAVEs at the Seattle Naval Hospital, to cost $92,693.

CONSTRUCTION—A. F. Mowat Construction Company, 1331 Third Ave. Bldg., Seattle, has been awarded $60,000 contract by U. S. Engineers for additional construction and installation in King County, Wash.

BUILDINGS—W. G. Clark Company, 408 Aurora Ave., Seattle, has been awarded contract by U. S. Engineers for buildings in King County, Wash.

BUILDING—Cecil R. Beal and H. W. Raun, Republic Bldg., Seattle, have been awarded contract by U. S. Engineers for building in Clallam County, Wash.

BUILDING—Sound Construction and Engineering Company and Ford J. Twaits, Moses Lake, have been awarded contract by U. S. Engineers for building in Spokane County, Wash.

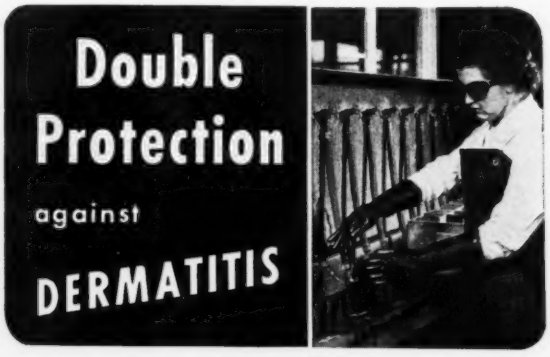
ADDITIONAL CONSTRUCTION—A. C. Goerig Construction Company, 1144-21st Ave. N., Seattle, has been awarded contract for additional construction in King County, Wash., by U. S. Engineers.

ADDITIONAL CONSTRUCTION—Woodworth & Co., and Macdonald Building Company, Tacoma, have been awarded contract by U. S. Engineers for additional construction in Grant County, Wash.

BUILDING—Hazen and Clark, Welch Bldg., Spokane, have been awarded contract by U. S. Engineers for building in Spokane County, Wash.

WYOMING

MILL—It is reported Lewis F. Johnson, Auburn, Calif., has accepted the Williams-Luman copper property on Copper Mountain, near Shoshoni, Fremont County, Wyo., and plans to erect a 200-ton mill.



Neoprene Stanzoils keep hands safe from outside harm—and from allergy to rubber gloves

Stanzoils of DuPont neoprene withstand attack of oils, acids, caustics so well they often last 3 to 7 times as long as rubber gloves—which gives you the best possible hand protection as well as expense saving. But also, neoprene Stanzoils do not cause dermatitis of the hands as rubber gloves do in some cases. It pays you to give your war-busy hands the double safety of Stanzoils—black, white, all standard styles and sizes. Write today for full data.

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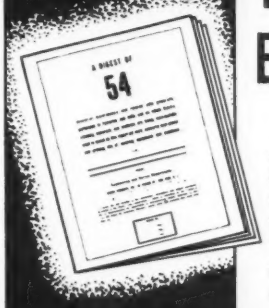
MADE WITH DU PONT NEOPRENE

FREE Plant Maintenance DIGEST



TELLS HOW TO CLEAN...

Heat Exchangers
Air Hose . . . Rubber Belting
Gas Welding & Cutting Tips
Goggles & Respirators
Hydraulic Systems
Machine Tools
Gas Burners, Fuel Nozzles
Air Conditioning Equipment
Walls, Woodwork, Floors
Refrigerating Equipment
Air & Gas Compressors
Dynamometers
Spot Welding Machines
Electrical Equipment
Cutting Oil Supply Tanks
Paint Spray Booths
Water, Steam, Gas Meters
Annealing, Brazing Furnaces
AND 33 OTHER TYPES OF EQUIPMENT

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sent for this informative PLANT MAINTENANCE DIGEST? Because in it you will find . . . as they did . . . plant-proved techniques based on the average successful, current experience of a thousand concerns . . . methods for expediting repair and overhaul work, shortening downtime of needed equipment, eliminating fire and other hazards, saving time and manpower on 54 different, commonly recurring maintenance jobs.

In this newly revised FOURTH EDITION is a concise description of each job or operation, the Oakite materials used, the amounts and procedures for applying, together with brief comments on the economies and other advantages resulting.

To indicate the variety and scope of the subject matter in this NEW DIGEST, a partial list of the equipment discussed appears in panel at left.

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The ideas and short-cuts in this free DIGEST are yours to use without cost or obligation as our contribution to better wartime maintenance. Write your nearest Oakite Technical Service Representative below for your copy which will be promptly mailed on request.

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WESTERN TRADE WINDS

NEWS ABOUT THOSE WHO DISTRIBUTE AND SELL INDUSTRIAL EQUIPMENT AND MATERIALS

Jack Hare has been appointed brushing technician by The Osborn Manufacturing Company, Cleveland, Ohio, for the Southern California territory, with headquarters at 10510 Almayo St., West Los Angeles, California. The Osborn Manufacturing Company produces industrial brushes to be used in metal finishing and cleaning operations such as burring, removing scale, and many other applications in the building of planes, tanks, ships and ordnance materials.

Gavin S. Younkin has been named Los Angeles district office manager, San Francisco branch, Brown Instrument Division, Minneapolis-Honeywell Regulator Company of Minneapolis.

The Portland plant of the Willamette Hyster Company has established a buying office in the LaSalle-Wacker Building in Chicago with **Cliff Dunham** of Portland in charge.

Fred H. Currie has been appointed manager of sales for the Pacific Coast, for Copperweld Steel Company, Warren, O. His offices are at 403 West Eighth Street, Los Angeles.

D. Earl McElroy has been appointed special mill representative on the Pacific Coast for Lukens Steel Company and its subsidiaries, By-Products Steel Corp. and Lukenweld, Inc., Coatesville, Pa.

New headquarters of **W. T. Billard Company,** material handling equipment firm, at 536 West Washington Blvd., Los Angeles, phone PRospect 3676, with cut of W. T. Billard, manager of firm, in corner.

Westinghouse Electric Supply Company names **J. Clyde Williams** of San Francisco manager of Oakland branch, and **Howard G. Brown,** apparatus and supply manager in San Francisco.

J. A. Old, staff member of Wickwire Spencer Steel Company for ten years, has been named Pacific Coast sales manager, succeeding T. H. McSheehy who has been made sales manager, wire rope division, for the entire country.

Utility Tool and Die Manufacturers have moved their offices and plant to their new location at 1370 West Washington Boulevard, Los Angeles 7, from 537 Commercial Street, Glendale. Their telephone number is RIchmond 0385.

The Milnic Company, 119 Harrison Street, San Francisco, has been appointed representative of the Paine Company, Chicago manufacturers of hanging and fastening devices, to cover Fresno, Northern California and Nevada territory north of Las Vegas.

L. B. (Larry) Sanden, formerly with Soule Steel Company and Kaiser Cargo, Inc., has become associated with the Transmission Engineering Company, San Francisco, in their sales effort in Northern California.

Claude M. Livermore has become associated with the Earl M. Jorgensen Company, 10510 South Alameda Street, Oakland, California, who recently expanded activities to include sale of Timken graphitic steel in Arizona and Southern California.

The Accurate Machine Products Company has been formed by J. W. Boening and W. J. Phelan at 1640 South Hobart Blvd., Los Angeles, to manufacture the I-G-C Countersink Relief Grinding Fixture, formerly made by the Industrial Grinding Company.

Edward L. Henshaw and Richard Hansen, under the firm name **Henshaw and Hansen,** have taken offices in the Chamber of Commerce Building, Los Angeles. They specialize in industrial relations research, job analysis and evaluation.

The Gerber Products Company, Freemont, Michigan, has purchased Elmhurst Packers, Inc., of Oakland. E. H. Nielsen, William U. Hudson, Fred S. Wyatt and Fred Greenlee of the Elmhurst organization will continue at managerial posts at the Oakland plant, where Gerber baby foods will hereafter be produced.

William Courtland Kinnon has been named manager of the new Phoenix, Arizona, branch of Allis-Chalmers Manufacturing Company, with headquarters in the Luhrs Towers Building, Phoenix.

The Whiting Corporation, Harvey, Illinois, has placed **A. J. Brown** in charge of its Pacific Coast branch at 1151 South Broadway, Los Angeles, to supervise sales and engineering activity in California, Oregon and Washington.

The Airco Tool Company of Santa Monica, California, has changed its name to **Arcturus Manufacturing Corporation.**

Alfred C. Sanger, well known on the Pacific Coast, has been appointed sales manager for the appliance divisions of General Electric Company's appliance and merchandise department.

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ON THE USE OF PLASTICS

For war needs now and for planning postwar products ... send for illustrated booklet describing Tenite applications and properties.

WILSON & GEO. MEYER & CO.

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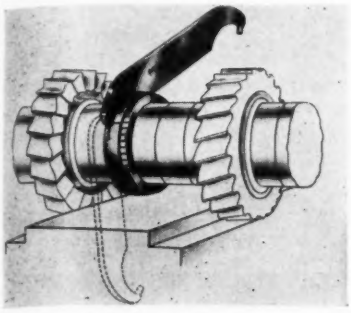
THE SHOWCASE

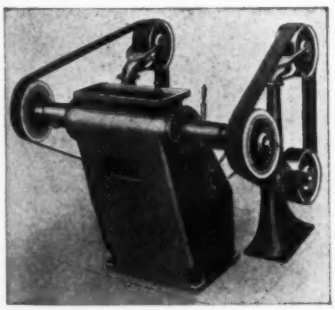
Spacing Collars—Adjustable Spacing Collars, useful for speeding up milling machine set-ups, are offered from ⅞" to 5 ½".



They eliminate need for using milling machine cutter arbor shims and provide adjustment for spacing of straddle mills without removal of cutters or collars from cutter arbor. Spanner wrench and case are standard equipment. *The Dayton Rogers Mfg. Co., Minneapolis, Minn.*

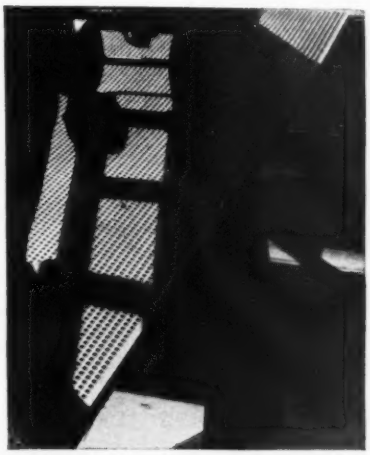
Die-Casting Machines—Machines capable of extremely high pressures without danger of breakage and so designed that the same die-locking assembly can be used with interchangeable hot-metal ends, one for zinc, tin and lead alloys, and the other for aluminum, brass and magnesium alloys. *The Cleveland Automatic Machine Company, Cleveland, Ohio.*

Abrasive Belt Backstand Idler—A floor-type model, No. 120, is especially designed for crowded grinding and polishing departments, can be quickly and easily connected to any regular grinding or polishing lathe by even an inexperienced workman. Other features are conveniently located controls at front of the machine, adjustable spring belt tightening and positive screw belt aligning. The backstand will take any belt size up to 6 in. wide, is designed for belt speeds up to 10,000 surface feet per minute, and is so built that simple dust collecting hoods can be installed. *Jones Engineering Co., Ellwood City, Pa.*



Multiple Tool Holding Device—An accurate tool post turret, "Zero-Tol" is a dual performance turret with automatic adjustable and replaceable indexing, strong enough for heaviest roughing jobs. Inexperienced machinists can do an accurate job on the finest tolerances. A totally enclosed locking nut with dust ring plus the fact that the indexing mechanism is inside a counter bored recess keeps any dust from the post. *Mark Naught Company, Portland, Oregon.*

Steel Safety Ramp — A Safety-Tread Ramp developed to provide non-slip security for men and machines. It can be supported in the center or may be stiffened with turned-down edges to make self-supporting portable or stationary ramp or plate. The safety treads have perforated holes punched through the tops of the raised buttons. Oil, water and other liquids will not cling to the edges of the holes. If desired, plates can be furnished without perforated holes. *Morton Mfg. Co., Chicago, Ill.*



Backstand-Idler Pulley—Hammond No. 3 Abrasive Belt Backstand Idler, used in conjunction with abrasive belts running over contact wheels employed on existing grinding and polishing equipment, has new and improved Spring Loaded Adjusting Screw and Hand Wheel to make easy work of maintaining tension of belts or releasing tension for making changes. *Hammond Machinery Builders, Inc., Kalamazoo, Mich.*

Portable Spark Plug Testing Unit—Is designed to completely test and overhaul BG, Aero, Bendix, Aircraft and A.C. airplane spark plugs in the shop or field, the unit, operated by one 1/8 h.p. electric motor, has a hand crank for use when 110-V power is not available, and a hand pressure test bomb for use when CO_2 fails. Also included is a point setter electrode adjuster. The top, held in vertical position by steel supports, includes two built-in racks capable of holding 28 spark plugs. *Airplane Manufacturing & Supply Corp., Manufacturing Div., North Hollywood, Calif.*

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Name..... *Title*.....

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THE SHOWCASE *(Cont'd from Pg. 63)*

Oil Protection —Kover-Oil, new product which may be easily applied by brush or spray, is recommended for painting machinery, motors, walls, beams, floors, and other surfaces subjected to excessive oil or grease, to prevent oil penetration and making them easier to clean. It is available in standard colors of buff, gray, red, and green, or in any color when ordered in quantities of over thirty gallons. *Rock-Tred Corp., Chicago, Ill.*

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"MARKWELL" STAPLING DEVICES

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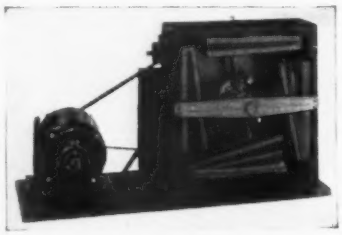
115 S.W. 2nd Ave. — Portland, Oregon
510 First Ave. South — Seattle, Washington

Vacuum Pump—A positive-type vacuum pump for production and laboratory applications available in two sizes, is supplied for individual electric-motor drives,



or without motors. It employs four bellows mounted within a square wood frame, connected to each other and to pump outlet by a channel running through the frame. Bellows are driven for a revolving shaft through connecting straps. The shaft is V-belt driven at about 200 rpm. Units are rated at 7 and 15 cu. ft. displacement at 4 in. of mercury. The pumps are equipped with governors to vary their capacities. *American Automatic Typewriter Company, Chicago, Illinois.*

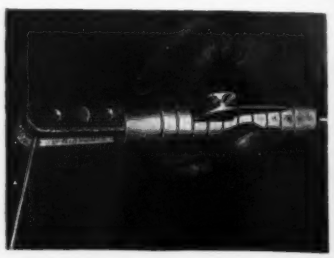
Self-Indexing Bed Turret—Has six tool stations and six individual stops indexing with the turret. Back-indexing can be done by hand to speed production when using less than a full set of six tools. Accurate precision is insured because index bushings and lock pins are of hardened and ground tool steel. Turret head is mounted on a pre-loaded Timken bearing, which can be adjusted for wear. Ways are hand scraped. The attachment is lever operated for rapid action and has a maximum stroke of 4 in. with a minimum index stroke of 1½ in. and total travel, including the index, of 5½ in. The turret is shipped completely assembled except for turret holes which are left to be bored on the individual machine, to insure perfect fit. *Kessler Aero Tool Co., Burbank, Calif.*

Vise and Angle Plate — A versatile vise applicable to any machine tool and facilitating up to twenty operations involving angles of any type, is mounted by T-bolts, is portable and easily moved from one machine to another. The vise swings through 180° in the top plane, 90° in the vertical plane and 360° in the bottom plane and is completely graduated in all planes. *Wesson Company, Ferndale Station, Detroit, Mich.*

Floor Cleaning Compound — Fibre-Tex for sweeping floors clean is claimed to be grease and oil absorbing and to have an active cleaning effect when consistently applied. It is said to be fireproof against the open flame of such equipment as blowtorches and not subject to spontaneous combustion. Comes in 50-lb. packages. *Lacey-Webber Co., Kalamazoo, Mich.*

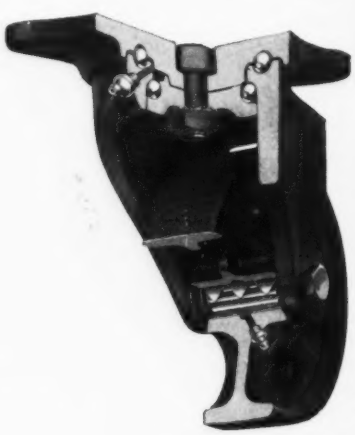
Pressure Regulator—Model No. 4000-1000 Pilot Type, pressure reducing regulator gives greater pressure accuracy because the specially designed diaphragm is gas-loaded instead of spring-loaded and is so constructed that damage to or rupture of that diaphragm is virtually impossible. The loading pressure of the main regulator is controlled by a built-in pilot regulator. If the operator wishes to diminish a previously set operating pressure, he releases the tension screw of the pilot regulator and exhausts the dome pressure by a non-leak release valve. *Victor Equipment Company, San Francisco, Calif.*

Air-Cooled Electrode Holder—Air cooled for use on heavy metallic arc welding jobs, such as heavy gauge armor plate, these in-



sulated holders are cooled by air at from 3 to 4 pounds pressure, traveling the entire length of the lower tong. Material used is a special high conductivity copper alloy. *Jackson Products Company, Detroit, Mich.*

Casters—Nicro Steel easy-swiveling casters for portable tanks, pumps, floor trucks, etc., are furnished with either metal or composition floor-protective wheels. Roller



bearings are standard in most models; porous iron or other bearings can be had for metal wheels. Pressure lubrication fittings are provided in both swivel and wheel. Loads from 400 to 800 pounds per caster over wood or concrete floors are claimed satisfactory. Wheel sizes range from 3 to 6 inches in diameter. *Rapids-Standard Co., Inc., Grand Rapids, Mich.*

YOURS FOR THE ASKING

1321

Lighting—"Industrial Hygiene and Plant Efficiency Through Good Lighting" reprints detailed lighting standards developed by the Illuminating Engineering Society. This pamphlet supplies in precise and tangible terms the answer to the question "What is good lighting?" *Div. of Labor Standards, U. S. Dept. of Labor, Washington 25, D.C.*

1322

Wheelabrator Operator's Manual—Booklet on care and operation of Wheelabrator airless abrasive blast cleaning equipment gives instructions and suggestions based on practical operating experience. Much of the information will interest all users of abrasive blast cleaning equipment. *American Foundry Equipment Co., Mishawaka, Indiana.*

You owe it to yourself to keep posted—only the efficient business survives under the strain and pressure of the war effort. Literature listed in these columns may be just the answer to your need for greater production, substitute materials or knowledge of how to care for your equipment. Just drop a note to Western Industry, 503 Market St., San Francisco, and copies will be forwarded to you. If you do not use business letterheads; please name your company affiliation.

1323

Heat Transfer Equipment—Catalogue No. 143 covers heat transfer equipment for every application, giving brief summary of the company's accomplishment in the heat transfer field. *Young Radiator Co., Racine, Wis.*

1324

Crane Maintenance—32-page illustrated booklet No. C-28, "P & H Crane Trouble Shooter" is arranged in simple question and answer form to create clearer understanding between crane operators and service or maintenance crews. Included are complete lubrication charts, standard crane operating signals, operating cautions, etc. Is an excellent handy reference book. *Harnischfeger Corp., Milwaukee, Wis.*

1325

Valve Seats—Circular describing renewable seats and re-seating tools for valves, faucets, bibbs, etc. This provides the answer to many maintenance problems. *The Economy Valve Seat Company, Chicago, Ill.*

1326

Electronic Tubes—24-page nontechnical book, "How Electronic Tubes Work," is designed primarily for industrial engineers. Illustrated with 117 sketches and photographs, the book GEA-4116 is a primer whose main emphasis is on how the electronic tube operates. The eight basic types of industrial electronic tubes and their uses are described. *Dept. 6-215, Publicity Divisions, General Electric Co., Schenectady, New York.*

1327

Bearings—"Facts About Anti-Friction Bearings," 32-page book tells why bearings are used, the function of each type of bearing, how loads are transmitted, the whys and wherefores of bearing designs and uses. It contains many illustrations and is written in simple, easy-to-grasp language. *Ahlberg Bearing Company, Chicago, 32, Illinois.*

1328

Carburizing Baths—Bulletin "Holden Liquid Carburizing Baths" gives necessary instructions for operating such a bath and describes results obtained at various times and temperatures. *A. F. Holden Co., New Haven, Conn.*

1329

Post War—"Markets After the War" is designed to assist marketing analysts in setting their sights on a common goal of postwar opportunity for American business. *Bureau of Foreign and Domestic Commerce of the Dept. of Commerce. U. S. Govt. Printing Office, Washington, D.C.*

1330

Compressor Calculator—Ingenious compressor calculator, made of heavy stock, 3½ by 8½ inches, is designed to save time in computing compressor requirements or in estimating the performance of present compressor units. Of slide rule design, the unique engineering tool can be used for quickly estimating the volumetric efficiency, brake horsepower and total piston displacement of any make of compressor. Instructions come with the calculator. *The Cooper-Bessemer Corp., Mt. Vernon, Ohio.*

2 HEAVY DUTY, SPARK-PROOF FLOORING MATERIALS

That Keep 'em Rolling...!

The above photo illustrates how heavily laden, small-wheeled trucks sail over a ROCK-TRED resurfaced loading platform.

ROCK-TRED RESURFACER

Ready-mixed Rock-Tred is a heavy-duty, spark-proof resurfacer that can be easily and quickly applied over worn concrete, brick, metal, wood or composition floors, trucking aisles, loading platforms, etc.

Because it is factory prepared, Rock-Tred requires no mixing. Simply spread it over the old surface and trowel to a smooth finish. And, within 12-24 hours it will take any load that can be moved on wheels.

SPEED PATCH *Fixes* Floors, Loading Platforms, Ramps, and other areas without Delay, Takes Loads Immediately

Here's the toughest floor repair on the market. Quick too. In fact, broken floors, etc., can be repaired at the rapid rate of 1 sq. ft. per minute. And what's more . . . heaviest loads pass right over the repaired area the moment it is completed. Simple directions are—fill the broken area with ready-mixed Speed Patch and tamp solid. Nothing is easier—nothing is faster—nothing is better.

ACT AT ONCE . . . Keep your floors in tip-top condition, traffic fast and load worthy, by resurfacing with Rock-Tred, and making quick emergency repairs with Speed Patch.

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2003 RANGEVIEW DRIVE - - - - - GLENDALE 1, CALIFORNIA

YOURS FOR THE ASKING

1321

ighting—"Industrial Hygiene and Plant Effiency Through Good Lighting" reprints deiled lighting standards developed by the luminating Engineering Society. This pamlet supplies in precise and tangible terms the nswer to the question "What is good lightg?" *Div. of Labor Standards, U. S. Dept. of abor, Washington 25, D.C.*

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Valve Seats—Circular describing renewable seats and re-seating tools for valves, faucets, bibbs, etc. This provides the answer to many maintenance problems. *The Economy Valve Seat Company, Chicago, Ill.*

1326

Electronic Tubes—24-page nontechnical book, "How Electronic Tubes Work," is designed primarily for industrial engineers. Illustrated with 117 sketches and photographs, the book GEA-4116 is a primer whose main emphasis is on how the electronic tube operates. The eight basic types of industrial electronic tubes and their uses are described. *Dept. 6-215, Publicity Division, General Electric Co., Schenectady, New York.*

1327

Bearings—Facts About Anti-Friction Bearings," 52-page book tells why bearings are used, the function of each type of bearing, how loads are transmitted, the whys and wherefores of bearing designs and uses. It contains many illustrations and is written in simple, easy-to-grasp language. *Ahlberg Bearing Company, Chicago, 32, Illinois.*

1328

Carburizing Baths—Bulletin "Holden Liquid Carburizing Baths" gives necessary instructions for operating such a bath and describes results obtained at various times and temperatures. *A. F. Holden Co., New Haven, Conn.*

1329

Post War—"Markets After the War" is designed to assist marketing analysts in setting their sights on a common goal of postwar opportunity for American business. *Bureau of Foreign and Domestic Commerce of the Dept. of Commerce, U. S. Govt. Printing Office, Washington, D.C.*

1330

Compressor Calculator—Ingenious compressor calculator, made of heavy stock, 8½ by 8½ inches, is designed to save time in computing compressor requirements or in estimating the performance of present compressor units. Of slide rule design, the unique engineering tool can be used for quickly estimating the volumetric efficiency, brake horsepower and total piston displacement of any make of compressor. Instructions come with the calculator. *The Cooper-Bessemer Corp., Mt. Vernon, Ohio.*

2 HEAVY DUTY, SPARK-PROOF FLOORING MATERIALS

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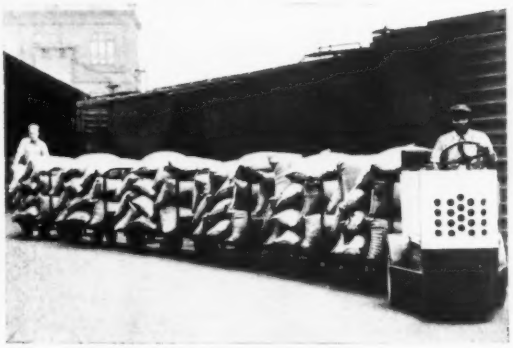

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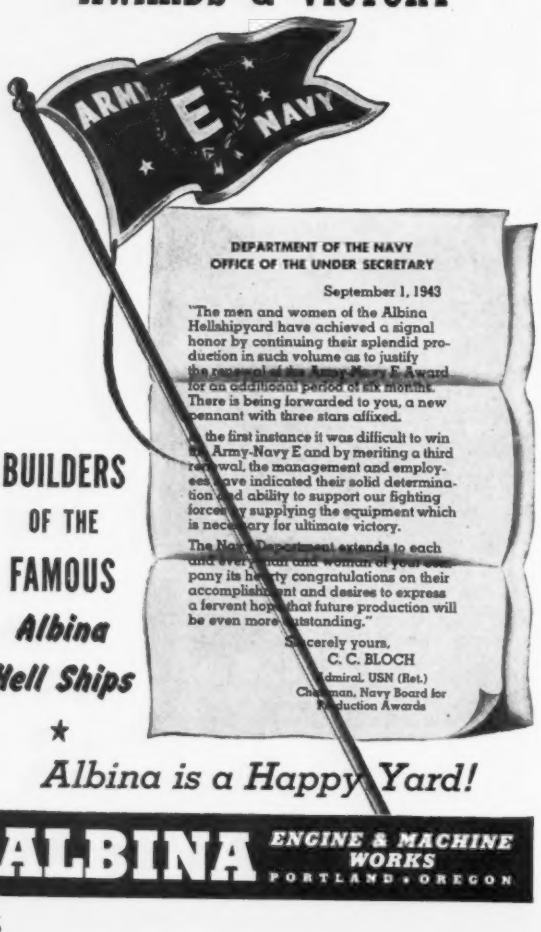
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"Get thar fustest with the mostest..." —*General Nathan Bedford Forrest*

In the shipment of war supplies, just getting there is not enough. They must get there fast, to be sure, in large quantity, but most important they must arrive at destination in tip-top condition. Cabco Allbound Crates and Boxes are proving their worth many times over in this vital phase of warfare.

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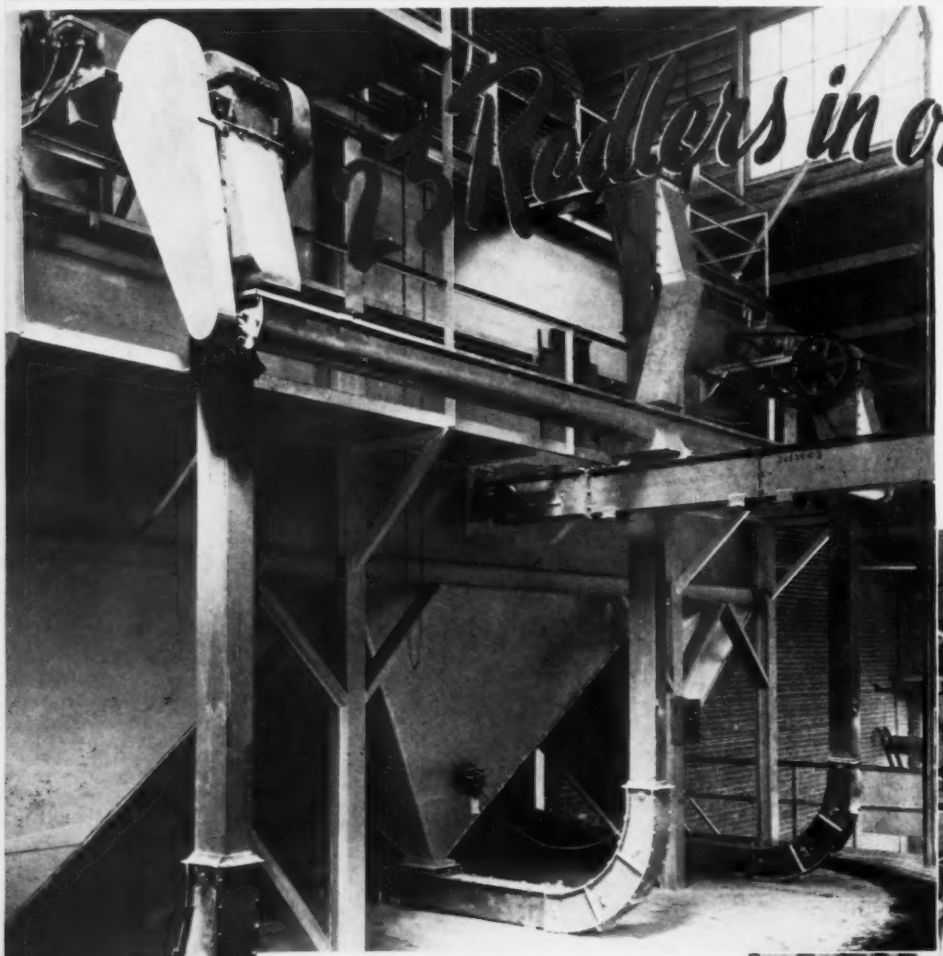

● *Battery of three L-type Redler Conveyor-Elevators and one Horizontal Redler handling a filter medium, celite and charcoal.*

● *Battery of Loop Boot Redler Elevators carrying grou copra cake to bagging machine. S. A. belt conveyor at le carries sacked material direct to trucks.*

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